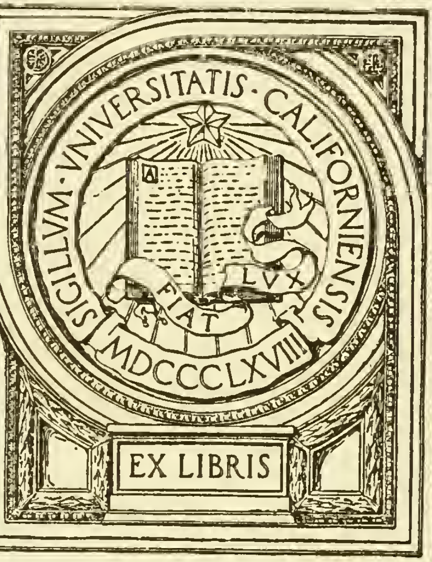
MEDICAL SCHOOL
LIBRARY


SIGILLVM · VNIVERSITATIS · CALIFORNIENSIS
FIAT LVX
MDCCCLXVIII

EX LIBRIS

Digitized by the Internet Archive
in 2016

https://archive.org/details/minnesotamedicin14unse

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association.
Northern Minnesota Medical Association, Minnesota Academy of Medicine, and
Minneapolis Surgical Society

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

EDITING AND PUBLISHING COMMITTEE

A. S. Hamilton, M.D., Minneapolis
D. C. Balfour, M.D., Rochester
J. T. Christison, M.D., St. Paul
E. L. Gardner, M.D., Minneapolis
John M. Armstrong, M.D., St. Paul
R. E. Farr, M.D., Minneapolis

EDITOR
Carl B. Drake, M.D., St. Paul
ASSISTANT EDITOR
Lewis M. Daniel, M.D., Minneapolis

ASSOCIATE EDITORS

First District
A. B. Stewart, M.D., Owatonna

Second District
F. M. Manson, M.D., Worthington

Third District
Geo. B. Weiser, M.D., New Ulm

Fourth District
H. B. Aitkens, M.D., LeSueur Center

Fifth District
F. U. Davis, M.D., Faribault

Sixth District
E. L. Gardner, M.D., Minneapolis

Seventh District
Paul Kenyon, M.D., Wadena

Eighth District
O. E. Locken, M.D., Crookston

Ninth District
E. L. Tuohy, M.D., Duluth

VOLUME XIV

JANUARY TO DECEMBER, 1931

EDITORIAL AND BUSINESS OFFICES
2642 University Avenue - - - - - - - - - Saint Paul, Minn.
BUSINESS MANAGER
J. R. Bruce

Copyright, 1931

Minnesota State Medical Association

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association. Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XIV January, 1931 No. 1

BACTERIOLOGY OF ACUTE RHEUMATIC FEVER WITH AN EXPERIMENTAL BASIS IN ANIMALS FOR VACCINE THERAPY*

B. J. Clawson, M.D.
Department of Pathology, University of Minnesota
Minneapolis

TWO aspects of the bacteriology of acute rheumatic fever are considered in this paper: (1) the evidence that acute rheumatic fever is due to a streptococcus (not a specific strain); and (2) experiments in animals suggesting a possible basis for vaccine therapy against these streptococci.

It is now generally agreed that acute rheumatic fever is an infectious disease, but opinion is still divided as to whether the disease is of streptococcic origin or is produced by an unknown virus.

The evidence that rheumatic fever is caused by a diplococcus (streptococcus) has recently become fairly convincing. The following facts support this idea: (1) streptococci can be cultured from the blood and joint fluids in a relatively high percentage of cases; (2) agglutinins against streptococci are commonly found in the blood of patients with rheumatic fever; (3) bacterial endocarditis, which is known to be of streptococcic origin, cannot be sharply separated clinically or anatomically from acute rheumatic endocarditis; (4) streptococcic lesions produced experimentally in animals (endocarditis, Aschoff nodules, subcutaneous rheumatic nodules) bear a close resemblance to corresponding lesions in man; (5) there is a definite similarity in the allergic reactions to streptococci in persons having acute rheumatic fever and in animals made hypersensitive to streptococci experimentally.

It is to be observed in Table 1 that the organism commonly recovered by the various workers from the blood, joints, and pericardial exudate before death or at the time of necropsy from patients with acute rheumatic fever or chorea is a diplococcus or a streptococcus. The frequency with which this organism is found appears to be too great to be due to secondary invasion.

The following workers have made attempts to culture the blood, joints, or pericardial exudates: Tribolet and Coyon,[1] Apert,[2] Westphal, Wassermann and Malkoff,[3] Poynton and Paine,[4] Philipp,[5] Loeb,[6] Beaton and Walker,[7] Beattie,[8] Camisca,[9] Beattie and Yates,[10] Collins,[11] Rosenow,[12] Herry,[13] La Fetra,[14] Morse and Floyd,[15] Swift and Kinsella,[16] Quigley,[17] Zinsser and Yu,[18] Suranyi and Forro,[19] Nye and Seegal,[20] and Cecil.[21] All but three of these reported finding diplococci or streptococci in from 8 to 83.5 per cent of the cases examined. Six hundred and thirty-three cases were cultured with an average of 60 per cent of positive results.

The organisms do not conform to a specific strain in respect to the action on the blood agar plate, the fermentation test, or the immunological reactions. Most of the strains reported appear to have been in what is now called the *Streptococcus viridans* group, but typical hemolytic strains in smaller numbers have been reported. Strains inactive on the blood agar plate have been mentioned. It has been our experience that these strains after a few transfers on blood agar produce the green zone about the colony. The lack of conformity to a single strain is illustrated by agglutinating and cross agglutinating strains from acute rheumatic fever and subacute bacterial endocarditis against their respective sera. The majority of the organisms from both sources fall into a common group. The remainder appear to be an irregular group made up of strains

---

*Read before the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

TABLE I

BACTERIAL FINDINGS IN ACUTE RHEUMATIC FEVER

Authors	Time	Organism	No. of cases	Percentage positive
Triboulet & Coyon	1897	Diplococcus	6	100
Triboulet & Coyon	1898	Diplococcus	11	100
Apert	1898	Diplococcus	2	50
Westphal, Wassermann & Malkoff	1899	Streptococcus	1	100
Poynton & Paine	1900	Diplococcus	8	100
Philipp	1903		31	0
Loeb	1908	Diplococcus	45	17.5
Beaton & Walker	1903	Diplococcus	15	100
Walker & Ryffel	1908	Diplococcus	3	0
Camisa	1910	Streptococcus	9	67
Beattie & Yates	1913	Streptococcus	106	45
Collins	1913	Streptococcus	2	100
Rosenow	1913	Streptococcus	8	87.5
Rosenow	1914	Streptococcus	7	57
Herry	1914	Diplococcus	60	71.6
La Fetra	1915	Streptococcus	2	100
Morse & Floyd	1916	Streptococcus	26	8
Swift & Kinsella	1917	Streptococcus	58	12
Quigley	1918	Streptococcus	21	50
Zinsser & Yu	1928	Streptococcus	4	100
Suranyi & Forro	1928	Streptococcus	25	68
Cecil	1928	Streptococcus	29	31
Nye & Seegal	1929		25	0
Cecil	1929	Streptococcus	29	83.9
Clawson	1930	Streptococcus	100	50
Total			633	60

which, as a rule, are agglutinated only with homologous sera.

The conclusions to be drawn from the findings of the various workers on the basis of morphologic, cultural, and immunological characteristics is that the group of streptococci isolated from cases of rheumatic fever cannot be considered a specific one, but that it represents a heterogeneous group, generally green-producers on blood agar, with moderately low virulence.

Relatively little work has been done to determine the incidence of immune bodies in the sera of rheumatic fever patients. In the sera of seven of twelve cases, Tunnicliff found agglutinins for streptococci. Swift and Kinsella found no agglutinins in five patients tested. I have tested the sera of twenty-five patients having acute rheumatic fever and in twenty of these agglutinins have been present in dilutions ranging from 1:50 to 1:800 (Table 2).

The distinction between subacute bacterial endocarditis and rheumatic endocarditis is often difficult to make clinically. Streptococci may be cultured from the blood in both cases, but much more readily from bacterial endocarditis because of the greater number of organisms in the blood stream. A consideration of the method of culturing may be helpful in deciding whether the organisms cultured are from a case of acute rheumatic fever or from a case of bacterial endocarditis. Growth in liquid media may be from either, but, if several colonies develop from a blood agar plate, when the blood used is from the patient, the evidence is strong that the case is what is called clinically bacterial endocarditis.

In endocarditis immediately associated with rheumatic fever (rheumatic endocarditis, simple verrucous endocarditis), the heart valves on gross examination show small, smooth, globular nodules at the points of contact of the leaflets. The chief lesions found on the valves in subacute bacterial endocarditis are soft villous vegetations. The consistence and size of these vegetations make it easily possible for particles to break loose into the blood stream and produce the embolic processes so commonly found in subacute bac-

TABLE II

FREQUENCY OF IMMUNE BODIES IN PATIENT'S SERUM

Author	No. examined	Positive	Negative
Tunnicliff	12	7	5
Swift and Kinsella	5	—	1
Clawson	25	20	5

terial endocarditis, but vegetations of the rheumatic type are found mixed in with the large soft vegetations in at least two-thirds of the cases of subacute bacterial endocarditis. This frequency of association of the two lesions seems to be too great to be explained on a basis of double infection.

Microscopically the lesions of the valves in acute rheumatic endocarditis show the inflammation beginning within the substance of the leaflet. The inflammatory reaction is polyblastic in character. The cells are round and spindle shaped with abundant cytoplasm. The valve tissue beneath the thrombus in cases of subacute bacterial endocarditis shows a reaction similar to that found in the valves in acute rheumatic endocarditis. This gross and microscopic similarity in the vegetations and in the cellular reaction strongly suggests a similar etiologic agent in the two kinds of endocarditis. The subacute bacterial type has been definitely proved to be of streptococcic origin.

In considering whether the streptococcus may be the etiologic agent in producing acute rheumatic fever, much importance rests upon whether lesions similar to human rheumatic lesions can be produced experimentally in animals. Many workers have produced valvular endocarditis experimentally by injecting streptococci. Apparently, in most cases the lesions are large and simulate the bacterial type, but vegetations characteristic of the rheumatic type are not infrequently encountered. Experimental nodular lesions structurally similar to the so-called Aschoff bodies have been produced in the myocardium and the subcutaneous tissues by Coombs, Miller and Kettle, Jackson, and me. By injecting streptococci into rabbits and monkeys I was able to produce an arteritis which appears similar to that described by Pappenheimer and Von Glahn as being specific for acute rheumatic fever.

The experiments and observations of Swift and Birkhaug and my recent experiments have shown that there is a marked similarity in the hypersensitiveness (allergy) in patients having acute rheumatic fever and in animals made hypersensitive experimentally to streptococci.

The facts that streptococci are recovered from the blood and joints in so high a percentage of cases of acute rheumatic fever, that agglutinins for streptococci are so frequently found in the blood in cases of acute rheumatic fever, that the lesions in acute rheumatic fever are so similar to those in subacute bacterial endocarditis (which is known to be due to streptococci), that lesions similar to those found in acute rheumatic fever can be produced in animals by injecting streptococci, and that there is a definite similarity in the hypersensitiveness to streptococci strongly suggest that the most probable cause of acute rheumatic fever is the streptococcus. It remains to be seen what can be done in the way of treatment by combating these organisms.

In recent experiments I have been able, by giving intravenous vaccinations, to desensitize animals made hypersensitive to streptococci experimentally and prevent the development of subcutaneous nodular lesions, which are the nearest approach to rheumatic lesions in animals yet produced. Subcutaneous injections of vaccines do not protect the animals. Since the hypersensitiveness to streptococci in patients with acute rheumatic fever appears to be similar to the hypersensitiveness in these animals, it seems possible that patients with acute rheumatic fever might be desensitized and the further progress of lesions prevented by receiving intravenous streptococcic vaccinations.

CONCLUSIONS

1. Acute rheumatic fever appears to be due to an infection with streptococci.
2. These streptococci do not appear to be a specific strain.
3. Streptococcic rheumatoid lesions in animals made hypersensitive to streptococci can be prevented by intravenous vaccination.
4. This method of vaccination may be indicated in patients with acute rheumatic fever, since such patients are hypersensitive to streptococci.

BIBLIOGRAPHY

1. Triboulet and Coyon: Compt. rend. Soc. de biol. 50:124, 1898.
2. Apert: cited by Cecil, R. L.: Jour. Exper. Med. 50:617, 1929.

28074

3. Westphal, Wassermann, and Malkoff: Berl. klin. Wchnschr. 36:638, 1899
4. Poynton, F. J., and Paine, A.: Lancet 2:861, 1900.
5. Philipp, C.: Deutsch. Arch. f. klin. Med. 76:150, 1903.
6. Loeb, L. M.: Arch. Int. Med. 2:266, 1908-9.
7. Beaton, R. M., and Walker, E. W. A.: Brit. Med. Jour. 1:237, 1903.
8. Beattie, J. M.: Brit. Med. Jour. 2:1781, 1906.
9. Camisca, G.: Centralbl. f. Bacteriol. 57:99, 1910-11.
10. Beattie, J. M., and Yates, A. G.: Jour. Path. and Bacteriol. 17:538, 1912-13.
11. Collins, J. R.: Brit. Med. Jour. 1:220, 1913.
12. Rosenow, E. C.: Jour. Infect. Dis. 14:61, 1914.
13. Herry, cited by Cecil, R. L.: Jour. Exper. Med. 50:617, 1929.
14. La Fetra, L. E.: Arch. Pediat. 32:135, 1915.
15. Morse, J. L., and Floyd, C.: Am. Jour. Dis. Child. 12:61, 1916.
16. Swift, H. F., and Kinsella, R. A.: Arch. Ind. Med. 19:381, 1917.
17. Quigley, W. J.: Jour. Infect. Dis. 22:198, 1918.
18. Zinsser, H., and Yu, H.: Arch. Int. Med. 42:301, 1928.
19. Suranyi, L., and Forro, E.: Berl. klin. Wchnschr. 7:354, 1928.
20. Nye, R. N., and Seegal, D.: Jour. Exper. Med. 49:539, 1929.
21. Cecil, R. L., Nicholls, E. E., and Stainsby, W. J.: Jour. Exper. Med. 50:617, 1929.

AMBRUSTER, RUSBY—AND ERGOT

For almost three years one Howard W. Ambruster, an importer of ergot, with the advice of H. H. Rusby, has charged vociferously, repeatedly, frantically, that the fluidextract of ergot U. S. P. of American manufacture, was grossly substandard. Controlled scientific evidence from creditable sources to sustain the charges has not been presented. In innumerable circular letters, in broadsides, in statements to the press and wherever he can get a hearing, Mr. Ambruster asserts there is a conspiracy on the part of the American Medical Association and of the Food, Drug and Insecticide Administration of the U. S. Department of Agriculture to approve substandard drugs. Not only has the American Medical Association as an organization been attacked, but various officials have been subjected to Ambruster's diatribes. Moreover, the American Pharmaceutical Association, the office of the Secretary of the Treasury, many pharmaceutic houses, office of the Secretary of Agriculture, the U. S. P. Revision Committee and others have been included. The campaign which Ambruster has waged and continues to wage would command admiration if there appeared to be any sincerely altruistic motive for it. But there appears to be no evidence to substantiate his charges. Both the Council on Pharmacy and Chemistry and the Journal of the American Medical Association have reported on two different occasions that there was no evidence that fluidextract of ergot U. S. P. as found on the market should not be used with confidence by American physicians. Last June the Committee on Agriculture of the United States Senate held hearings on the Ambruster charges. The evidence permitted to go into the record was not limited to the "indictment." Members of the medical profession and officials of the American Medical Association were grossly accused by Ambruster and Rusby. While a definite report has not been made by the Senate Committee as a whole, the impression created on the technical members of the committee and apparently shared by most of the nontechnical members was fairly well summarized by comments made by Senators Copeland and Hatfield in the closing days of the hearing. Senator Copeland held that no evidence has been presented to show that the quality of fluidextract of ergot was a menace to mothers in childbirth and that he had not heard any testimony to show that the government officials had been lax in their enforcement of the law. (Jour. A. M. A., September 6, 1930, p. 722.)

RHEUMATIC FEVER IN CHILDHOOD*

Henry F. Helmholz, M.D.,
Rochester, Minnesota

RHEUMATIC fever in childhood is an acute infectious disease, probably caused by a streptococcus and characterized by proliferative and exudative changes in the joints, serous membranes, heart, blood vessels and skin. The so-called rheumatic cycle includes tonsillitis, arthritis, carditis, and chorea. The disease, named for its most striking symptoms, is serious largely because of its crippling effect on the heart. Although the involvement of the joints is acute and severe, they usually become completely normal after an attack.

ETIOLOGY

According to practically all statistics, the disease is more common in the poorer classes in the United States as well as in Europe. The incidence of the disease has decreased with improvement in general hygienic conditions. Rheumatic fever makes up from 3 to 7 per cent of the medical diseases observed in children's hospitals.

Season.—In the United States and in Europe the majority of cases are noted in the winter and spring. Relapses also are most common at these seasons. In England, on the other hand, more cases are noted in the autumn. This difference in incidence never has been adequately explained.

Familial relationship.—There appears to be definite familial relationship to the disease. Whether this is due to environment or to infection carried from parent to child, or whether there is a real predisposition is difficult to determine.

Age.—The disease is seen only infrequently in children less than five or six years of age. In a series of 2,051 cases, Curschmann and Eckstein found that the disease had been acquired before the fifteenth year in 7.6 per cent, and of these children 80 per cent had carditis.

PATHOLOGY

The pathologic changes in the joints are not typical. Characteristic changes of rheumatic fever are found in the myocardium in the so-called Aschoff body, a small group of lymphocytes with a central mass of multinucleo-epitheloid cells. In recent years it has been shown that not only the heart, pericardium, myocardium, and endocardium are often affected but also the entire circulatory system, both pulmonary and systemic. The lesions of the heart probably are embolic in nature, the endocardial lesions resulting over areas of necrosis due to small emboli in the vessels of the valves. Recently, the interstitial changes of the mitral valves involving the entire leaflet have been emphasized. The changes in chorea probably are vascular.

SYMPTOMS

There is usually an antecedent upper respiratory tract infection, at times strikingly associated with fatigue, followed at a varying interval by high fever, marked perspiration, increased pulse rate and arthritis. Pain, tenderness, redness, and swelling in one or more joints appear, with later involvement of others, principally of the large joints. There may be a single cycle or a series of cycles of fever and arthritis involving numerous joints.

Characteristic arthritis disappears without permanent injury to joints. In certain cases the upper respiratory tract infection and the arthritis alone are manifested. In a great many cases, however, there also is evidence of involvement of the heart. In 95 per cent of Swift's series transitory changes of the heart according to weekly electrocardiograms were shown.

Carditis.—As the involvement of the heart is the most serious aspect of rheumatic fever, it is important to consider each case of rheumatic fever as possibly carditis until it has been proved definitely that the heart is not involved. The presence of Aschoff bodies in practically all cases of rheumatic fever demonstrates that myocardial changes are constant. The incidence of endocarditis is lower and that of pericarditis is still lower.

Since functional murmurs occur in childhood in practically all febrile conditions, it is at times extremely difficult to determine organic disease of the heart. It is practically never possible to make a diagnosis of endocarditis from a single examination of the heart alone. I have found the following points useful in the differential diagnosis: the functional murmur tends to be basal, but may be present at the apex in maximal intensity; it is usually rather harsh, representing a fraying out of the first sound without a sharp beginning but generally with a sharp end-point. The murmur tends to be louder in the recumbent position and to disappear on exercise. The murmur of endocarditis in its early stages is heard as a soft blowing, with a sharp beginning and a sharp end-point, and it is distinct from the first sound. The murmur is the same whether the patient is lying or standing and becomes more intense with increased action of the heart. In exceptional cases I have noted functional murmurs gradually assume the characteristics of an organic murmur.

---

*From the Section on Pediatrics, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Duluth, July 15, 1930.

A sufficient number of cases of acute endocarditis of the mitral valves has been described to demonstrate that the lesion may heal completely. Amberg and Willius have described such cases seen at The Mayo Clinic.

Pericarditis is usually manifested by a to-and-fro murmur, generally heard best along the left border close to the sternum.

Nodules.—The presence of rheumatic nodules seems to vary considerably from year to year. It has been my experience that during certain periods rheumatic nodules are very common; at other times they are not found, or are only present in small numbers. They are usually found on the back of the head or around the large and small joints of the feet, hands, legs and arms. By flexion and tightening of the skin over the joints the nodules usually appear about 0.5 cm. in diameter, although they may be as large as 1 cm. These nodules are helpful in the diagnosis of rheumatic fever and are of serious prognostic import if present in large numbers and in new crops.

Chorea.—Chorea should definitely be considered as part of rheumatic fever and not as a complication occurring as a later manifestation of the disease. Not infrequently it is a primary mode of onset.

Growing pains.—This symptom as evidence of rheumatic fever is extremely difficult to evaluate. The relation of growing pains to the disease has been over-emphasized by so many observers that indefinite pains in the lower extremities have been considered as a definite manifestation of rheumatic fever. In my experience, a great many cases of growing pains are the result of flat feet, and can probably be explained on this basis. If an acute infection of the upper respiratory tract is followed by indefinite pains in the lower extremities the possibility of rheumatic fever should be considered.

DIAGNOSIS

Polyarthritis that responds to treatment with salicylates and disappears without residue justifies a diagnosis of rheumatic fever. The occurrence of subcutaneous nodules, cardiac involvement, and chorea, alone or in any combination, is diagnostic of the disease.

The differential diagnosis must take into account polyarthritis disappearing without residue that occasionally is seen in serum disease, polyarthritis of gonorrheal origin, and polyarthritis of lupus erythematosus disseminata. Polyarthritis occasionally is seen with chronic ulcerative colitis. Acute rheumatic fever of the spine may be taken for meningitis because of the positive Kernig's sign and stiffness of the neck. The absence of meningeal irritation on spinal puncture, however, tends to make the diagnosis clear. Osteomyelitis may occasionally present diagnostic difficulties.

PROGNOSIS

The death rate from acute rheumatic fever is between 3 and 5 per cent. The prognosis becomes increasingly bad with each relapse because of the increasing frequency of endocarditis, myocarditis and pericarditis. In cases of obliterative pericarditis the prognosis is especially poor, although recent operative procedures have improved it remarkably. The presence of fever and an increased leukocyte count, even after the disappearance of other symptoms, usually means persistent infection. Elimination of foci of infection and a period of rest sufficiently long to give the cardiac lesions an opportunity to heal improve the prognosis. Kaiser, in a recent report on the effect of tonsillectomy on the incidence of rheumatic fever, stated that removal of the tonsils definitely decreased the incidence of rheumatic fever and carditis but that the number of cases of chorea had increased.

TREATMENT

It is well to emphasize the beneficial effect, almost forgotten, of salicylates given in large doses of from 4 to 6 gm. a day during the acute stage, watching carefully for evidence of toxicity, nausea, vomiting, and nephritis. Smaller doses of the drug may be continued for from one to two weeks after the disappearance of symptoms.

Removal of all foci of infection, tonsils in particular, should be carried out as early as possible after the disappearance of acute symptoms. This should be followed by a long period of rest, varying from six months to a year, in an attempt to effect cure of the carditis and chorea. As it is not possible to determine the changes in the heart during life, such protracted periods of rest seem to be justified.

SUMMARY

Rheumatic fever in childhood may be monosymptomatic or may show a few or all of the manifestations of the so-called rheumatic cycle. Complicating disorders of the heart are very common and constitute the serious danger of the infection. All patients with rheumatic fever should have foci of infection removed, and should be given a period of from one to two months of restricted regimen. Patients with carditis or chorea should be kept at absolute rest for periods of from six months to a year, after which the normal mode of life may be resumed gradually.

BIBLIOGRAPHY

1. Amberg, Samuel and Willius, F. A.: Recovery from valvular lesions in children. Med. Clin. N. Amer. 12:1535-1541 (May) 1929.
2. Curschmann, Hans, Eckstein, Albert, and others: Rheumaproblem. Leipzig, Georg Thieme, 1928, pp. 17-30.
3. Kaiser, A. D.: Unpublished data.
4. Swift, H. F.: Quoted by Cecil, R. L.: Text-book of medicine. Philadelphia, W. B. Saunders Co., 1929, pp. 77-91.

INCREASED POTENCY OF VIOSTEROL PREPARATIONS

The Wisconsin Alumni Research Foundation informed the Council on Pharmacy and Chemistry that the accumulated clinical experience with viosterol has shown that better results in the treatment of rickets are secured when a dosage of Vitamin D is used larger than that originally recommended and that the maximum limits of safety as to the amount of Vitamin D that can be used has now been more definitely determined than was the case when preparations of viosterol were first put on the market. Instead of increasing the dosage of the present products, the Foundation and its licensees determined to increase the potency of the preparations. It was decided to increase the potency of viosterol in oil so that instead of having 100 times the Vitamin D potency of a standard cod liver oil as determined on rats by the Steenbock line test, it shall have 250 times that potency, and, provided the Council should agree, to increase the potency of cod liver oil with Viosterol so that instead of having 5 times the potency of a standard cod liver oil as determined on rats by the Steenbock line test, it shall have 10 times that potency. The Foundation announced that these preparations of increased potency would be placed on the market beginning with October first. The Council on Pharmacy and Chemistry announces that it has accepted the changes of potency determined on by the Foundation and has changed the name of viosterol in oil 100 D to viosterol in oil 250 D and the name of cod liver oil with viosterol 5 D to cod liver oil with viosterol 10 D and has continued the acceptance of the viosterol preparations already accepted, under the new names. (Jour. A. M. A., October 4, 1930, p. 1021.)

RHEUMATIC CARDITIS*

Max H. Hoffman, M.D.,
Saint Paul

IT IS generally accepted that acute rheumatic fever is an infection due to some type of streptococcus modified by predisposing factors the nature of which we know very little.

The older term, acute articular rheumatism, stressed the joint manifestations. The more recently accepted designation—acute rheumatic fever—indicates its more general distribution. Even this name is not altogether correct, as there has accumulated much evidence to show the necessity of considering this disease to be of a subacute or chronic nature.

It is essentially a perivascular disease distributed throughout the body in a manner that has been likened to the wide-spread distribution of tuberculosis and syphilis. The various tissues of the heart are especially prone to involvement, and the resulting carditis is a very essential part of the picture. This form of heart disease must not be considered as being secondary to, or resulting from joint inflammation. It often appears without the presence or history of any arthritis. Although the joint lesions are the most dramatic in their manifestations, the heart lesion is most important, and may persist for many years after the arthritis has disappeared.

Heart disease ranks first in the list of those diseases producing death. Next to hypertension comes acute rheumatic fever as the agent responsible for heart fatalities. It has been estimated that rheumatic carditis contributes over 20 per cent of all cardiac deaths. The importance of this figure is further added to by the fact that most of this group are infected early in life, and the age group of these deaths is much earlier than the group caused by hypertension and arteriosclerosis.

It is not my purpose to discuss in detail the etiological factors concerned in the production of this disease. The relationship of foci of infection and rheumatic carditis has not been fully established. Hölsti's investigations have shown that the inflamed tonsil in this disease may be merely a part of the acute rheumatic fever, and not the source of the infection.

There also appears to be some hereditary or constitutional factors that predispose to the infection. Repeatedly, cases of rheumatic carditis are found in different generations of the same family. This has occurred sufficiently often to impress students of this disease with the possibility of there being an inherited predisposition.

PATHOLOGY

In the acute stages the disease is a septicemia. The lesions are formed around the blood vessels throughout the body, but especially in the joints, heart, nervous tissues and skin. The histology of the pathological change is essentially the same, no matter what tissue is involved. In the heart the acute lesion consists of a necrotic center with a zone of leukocytic infiltration and cell proliferation. Many round cells are present, and larger multinucleated cells are prominent. These lesions are all located around and in the walls of the smaller blood vessels of the coronary circulation, and bear the name Aschoff nodules.

Some degree of heart involvement is found in almost every case. Proliferative and exudative lesions are found in the endocardium, myocardium and pericardium. These tissues may be involved separately or together. It is not certain whether these changes are produced by the direct action of the bacteria or the toxins of the disease, or whether they are of the nature of an allergic reaction. Active lesions may be present for as many as thirty years after the disappearance of the joint inflammation. Scars in the myocardium are not frequently found, indicating the transient nature of most of these lesions.

The conduction system is especially liable to injury. Although this is difficult to demonstrate histologically, it is well shown by electrocardiograph studies. Poyton, who has studied this disease for over twenty-five years, considers the myocardial lesion to be the most frequent and most important change in children. It is usually overlooked for the reason that it often produces no clinical evidence.

Although the myocardial changes are the most important in the acute stages, it is the valvular disease that produces the severe crippling in later life. The valves most commonly involved are the mitral and aortic. Stenosis of the mitral valve is the typical valvular deformity found in this condition.

---

*Read before the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

For many years it has been held that the valvulitis occurred from the blood in the heart chambers, the inflammation extending from the surface inwardly. The more recent conception considers the infection starting as an interstitial valvulitis, and extending toward the surface. This belief has been further substantiated by the discovery of capillaries in the heart valves in adults. It was thought that these capillaries, normally present in the fetus, disappeared at birth. Deep valvulitis, without superficial erosion, is frequently found, and especially often in the valves of the right heart. Superficial valvulitis rarely occurs alone. We should consider the valvular lesion not as an endocarditis, but as an interstitial valvulitis.

The early valvular lesion consists of proliferation and exudation, with the edema playing an important part. The contact of the swollen leaflets at the margin of closure, very likely contributes to the superficial changes that take place in the approximating edges of the valves. In some individuals the proliferative changes are more marked than the exudative. This type of change is capable of producing the more severe kind of valvular deformities. Although valvular disease may be present at the period of acute inflammation, its evident signs may not appear until contraction of the scar occurs.

Pericarditis is a fairly frequent occurrence. The subpericardial tissue is richly supplied with blood vessels, and it is around and in these blood vessels that the inflammation takes place. If the process is sufficiently intense, the pericardial surface will be involved, and the characteristic rub will be produced. Severe congestion in the subpericardial capillaries may cause a rupture through into the pericardial sac, and a hemorrhagic pericarditis results. Exudation of fluid may take place, and often a large effusion is present.

The lesions in the heart take place in and around the smaller ramifications of the coronary arteries. Occasionally some of the larger blood vessels are involved, and anginal pains may be produced.

There may be some question as to the advisability of including the subject of subacute bacterial endocarditis in the discussion of rheumatic carditis. The exact relationship between these two forms of heart disease is not entirely clear. They present several points of similarity that would suggest that they are essentially the same disease. The valvular lesion, however, is very different. In the subacute disease the valve leaflets are injured, with the production of a soft, friable vegetative growth that breaks off and produces the embolic phenomena that are so characteristic of this type of valvulitis. The lesions in acute rheumatic fever are smooth and firm, and cannot be dislodged. Subacute bacterial endocarditis is a fatal disease, and about one-half the cases that come to autopsy show some of the typical rheumatic lesions, in addition to the vegetative changes found in the valves. Many of these patients have a history of previous joint lesions, subcutaneous nodes, and rheumatic carditis. In both conditions the blood will yield cultures of the same type of streptococcus. This would suggest that subacute bacterial endocarditis is nothing more than a very severe form of rheumatic heart disease, brought about by an unusually virulent type of streptococcus, or occurring in an individual who is extremely sensitive to this infection. It is important to make the differentiation, because of the difference in prognosis.

THE ONSET OF RHEUMATIC CARDITIS

The development of rheumatic carditis cannot be described as occurring in any typical manner. It is an essential part of the disease and has no time relationship to the appearance of the other lesions.

In children there may be present no findings other than the mild joint pains, growing pains, or slight chorea, which may be so insignificant as to be completely overlooked. In adults the joint and throat inflammation is usually quite definite, and demands a great deal of attention. The subcutaneous nodes, when they are present, are usually accompanied by heart involvement.

Leukocytosis and fever are the two main findings indicating activity. Often the valvular lesion does not present the diagnostic physical findings, for some time after the acute symptoms have disappeared. In fact, it is usually impossible during the acute stage to definitely say that a valvulitis is present.

Even very slight evidence of the presence of acute rheumatic fever, such as very minor joint pains, an occasional subcutaneous node, low grade fever and leukocytosis, should make one suspect the presence of a heart lesion.

It must be emphasized that there are a number of cases of rheumatic carditis that do not at any time present any other symptoms of acute rheumatic fever. This group comprises from 20 to 30 per cent of all the cases of rheumatic heart disease.

PHYSICAL FINDINGS AND DIAGNOSES

There is often a great deal of difficulty in determining the presence of the heart lesion. This is especially true when only the myocardium is involved. There are several observations that can be made, aside from the heart examination. Any increase in temperature or leukocytosis in a patient showing joint symptoms, but without the involvement of new joints, points toward the onset of a carditis. The presence of subcutaneous nodes usually indicates that the heart has been damaged. An unusually rapid pulse, out of proportion to the temperature, frequently means a myocardial injury.

The physical signs of early myocardial and endocardial involvement are usually not very definite. Dilatation can occasionally be made out by noting the shifting of the left border to the outside of the left mid-clavicular line. When the conduction system is involved, various degrees of heart block may be present, although it requires the use of an electrocardiograph to determine the less severe changes in the conduction time, and the other myocardial lesions. In the more severe degrees of heart block, dropped beat can be made out.

During auscultation, muffling of the apical tones is said to indicate edema of the valves. Frequently a soft systolic murmur is heard along the left sternal border. Libman believes this is a very early sign of valvular involvement. Ordinarily not much significance is attached to a murmur of this type, but when it occurs during the course of a rheumatic fever it may indicate cardiac damage, especially if it is accompanied by an accentuated second pulmonic tone.

When the pericardium is involved, and the surface becomes roughened, a characteristic sound is produced. This is usually a to-and-fro murmur, rather rough, and heard close to the ear. When the visceral and parietal pericardium become adherent this rub disappears. The disappearance and reappearance of the pericardial murmur indicates that activity is still present, and it is a valuable sign. In practically every case the presence of pericarditis means also some involvement of the other tissues of the heart.

Precordial pain and cutaneous hypersensitiveness often indicate the presence of a myocardial lesion. Swift has shown that over 70 per cent of the cases with arthritis and carditis had precordial pain, and that 90 per cent of the cases with subcutaneous nodules had pain and hyperesthesia.

He also observed that those patients with precordial distress had, as a rule, a more severe form of heart disease. The heart muscle itself does not respond to stimuli with pain, but the blood vessels and especially the adventitia, are capable of producing pain and hyperesthesia when they are inflamed. In acute rheumatic fever the lesion is located in and around the adventitia. If the large coronary vessels are involved the distress may be very similar to that which occurs in coronary sclerosis. The pericardial inflammation also produces precordial pain. Sometimes this is very severe, and often occurs with respiration.

THERAPY

Unfortunately we have no specific treatment for rheumatic carditis. From our knowledge of this disease, it appears that we must look to the immunologist for help in perfecting a desensitizing or immunizing agent.

Drugs do not play a prominent part in the treatment of this condition. There is no good evidence to show that salicylates have any effect in preventing the heart lesion or modifying the course of the carditis. There is no question but that it is of great value in relieving the patient of the distress due to the joint inflammation and fever. However, the remarkable symptomatic relief that it frequently produces, often gives the physician a false sense of security, as it masks the onset of the heart lesion.

Digitalis is frequently given as soon as a heart lesion is suspected. This form of therapy is certainly not indicated unless there are definite signs of heart failure. It is toxic to the heart muscle which is already suffering from the effect of the toxin of rheumatic fever.

The nature of the pathological change that takes place in this disease indicates the necessity for resting the heart until it has completely recovered from the effect of the acute process. As long as the pulse is rapid there is a good possibility that activity is still present. Fever, even though it be of a very low grade, is significant, and, along with leukocytosis, indicates that the infection is still present. These three conditions should be watched carefully. It is difficult to say just how long rest should be enforced. Four to six weeks after all signs of activity have left should be a minimum period of quiet. Usually the heart will completely recover from the myocardial lesion if given enough time. Too early or too vigorous exertion may cause serious damage.

It has been suggested that these heart patients should be treated in a manner similar to the treatment of a tuberculous individual—rest during the acute periods, followed by graduated exercise, sunlight and fresh air, until the patient is able to again become useful and active. Much work along these lines is now being done, especially in England, with rather encouraging results.

Lastly there arises the question—what part do foci of infection play in this disease, and how should they be attacked? As a matter of principle, all areas of infection should be removed. Infected teeth and sinuses do not seem to have a close relationship to this disease. Inflammation of the tonsils and acute rheumatic fever occur together so frequently that it would seem that there is something more than a mere coincidence. However, it has not been definitely shown that removal of tonsils prevents the rheumatic carditis or changes the course of the disease very markedly. It is generally agreed that infected tonsils should be removed, but it should not be done during the acute period of the disease, but rather after the fever has subsided.

A guarded prognosis should be given in every case, remembering that evidence of serious heart trouble may appear only many months after the first attack of arthritis; that this is, frequently, a very chronic type of disease, accompanied by many relapses or reinfections; and that with each exacerbation the heart lesion may become progressively worse. It should also be borne in mind that rheumatic carditis frequently occurs without any of the other obvious signs of acute rheumatic fever. Complete rest for a sufficient length of time, followed by graduated exercise, is the most important therapeutic measure.

REFERENCES

Bell, E. T., and Clawson, B. J.: Comparison of acute rheumatic and subacute bacterial endocarditis. Arch. Int. Med., 37:66, 1926.

Kerr, W. J., Mettier, S. R., and McColla, R. L.: Capillary circulation of heart valves. Tr. Assn. Am. Phys., 43:213, 1928.

Levy, R. L., and Turner, K. B.: Impaired auriculoventricular conduction; comparative study of diagnostic applications. Arch. Int. Med., 43:267 (Feb.), 1929.

Porte, D., and Pardel, H. E. B.: Occurrence of coronary T wave in pericarditis. Am. Heart Jour., 4:584 (June), 1929.

Poyton, F. J.: In Childhood: Lettsonian Lectures. Lancet 2:537 (Sept. 15), 1928; 589 (Sept. 22), 1928; 637 (Sept. 29), 1928.

Swift, H. F.: Rheumatic fever. Hektoen Lecture, Billings Foundation. Jour. Am. Med. Assn. 92:2071 (June 22), 1929.

Swift, H. F., and Hitchcock: Cardiac pain. Jour. Am. Med. Assn., 90:678 (Mar. 3), 1928.

Von Glahn, W. C., and Pappenheimer, A. M.: Diseases of the auricle and blood vessels. Tr. Assn. Am. Phys., 43:203, 1928.

THE PROTEAN PATHOLOGICAL MANIFESTATIONS OF RHEUMATIC FEVER*

EDWIN L. GARDNER, M.D.
Minneapolis

THE modern conception of the pathology of rheumatic fever is rapidly undergoing a change. The most evident clinical symptoms of the disease and the studies of the pathologists of twenty-five years ago had directed our attention toward the joint signs and the circulatory "complications." Aschoff in 1904 described in detail the histopathology of the minute inflammatory nodules of the ventricular myocardium, and Clawson has recently critically reviewed our present knowledge of the "Aschoff nodule" as observed in man and similar lesions as produced experimentally in animals. During the past decade, but especially during the past five years, there has been a renewed interest in the study of the histogenesis of this lesion which was formerly considered specific for this disease.

The "Aschoff nodule" is usually found in close relation to small arterioles or capillaries, and represents the reaction of connective tissue to the virus or its toxic products. The "typical" nodule varies somewhat depending upon the tissue involved, the virulence of the infection and the resistance of the patient. A constitutional factor has been suggested. In general the tissues show both a proliferative and an exudative reaction of varying degrees; it may be essentially proliferative with the formation of multinuclear giant cells resembling other types of granulomata, or it may be essentially exudative. The latter may be mostly lymphocytic and plasma cells, or at the other extreme be essentially polymorphonuclear with microscopic abscess formation, but suppurative lesions as a rule do not occur because of the low virulence of the rheumatic infection.

A lesion close to a serous membrane such as the epicardium, pleura or joint synovial membrane is likely to excite an exudative process in the serous cavity.

The late lesion or reparative scar is just as variable. The specificity of the "Aschoff nodule" has more recently been questioned, since an atypical proliferative nodule may be found in some "non-rheumatic" conditions where the virulence is low. It has been described for the myocardium in scarlet fever, pneumonia, subacute bacterial endocarditis, meningococcic infections, erysipelas and in general where the infection is due to relatively avirulent sterptococci.

The relation of allergy to the production of some of the tissue reactions, similar to that which is believed to occur in tuberculosis, is at the present time a very attractive field for study. It is difficult to explain all of the immune reactions of this disease without assuming such an hypothesis. Some experimental studies afford considerable evidence in favor of this viewpoint.

In another paper of this symposium the cardiac lesions of rheumatic fever have been discussed but an additional study of all of the known lesions affords us a better conception of the pathological process.

A. Lesions involving the larger arteries.

This is supposedly by the path of the vasa vasorium.

(1) The aorta.

Klotz in 1912 described a non-suppurative mesaortitis and also an involvement of the adventitia. Intimal changes may also occur, often similar to the endocardial lesions of the auricle. Typical Aschoff nodules are sometimes present near the nutrient vessels and in the adventitia. During the healing there may be patchy destruction of muscle fibres in the media due to interference with the blood supply. A patchy aortitis results which is probably in the more extreme cases a cause of dissecting aneurysms. The large areas of dilatation which occur in syphilic aortitis generally do not occur because there is not the widespread destruction in rheumatic disease of the aorta.

It is well to remember that not all cases of aortitis are syphilitic.

(2) The main pulmonary arteries may show lesions similar to those in the aorta, namely a proliferative mesarteritis near the nutrient vessel with secondary changes in the adventitia and intima. Thrombi may form in the injured vessels which may cause additional damage such as pul-

---

*Read before the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

monary atelectasis and compression endarteritis. The symptom-complex known as Ayerza's disease may be the end-results of such an arteritis.

(3) Lesions of other large arteries have been described in patients dying a cardiac death, but the evidence leaves a doubt as to the real etiology in many of these reports.

B. Lesions primarily affecting the smaller arterioles and capillaries.

As a rule the moderate size arteries show little or no demonstrable lesion. Only arterioles the size of an arterial nutrient vessel or smaller seem to be involved.

(1) The myocardium, valve leaflets, subendocardium, and subendothelial capillaries of the pericardium may be affected. These lesions have been discussed by others in this symposium.

(2) Pulmonary Aschoff nodules involving the interstitial tissue occasionally occur. This may be followed by an exudative process into the alveoli with some of the signs of an atypical pneumonia. It does not become a suppurative or an essentially exudative process such as clinicians see in lobar or post-influenzal pneumonias. The patients are often so free from symptoms and signs that true rheumatic pneumonia is overlooked. It is rarely in itself fatal, but there may be crippling sequelæ due to scar formation.

Rheumatic pneumonia must be differentiated from a lobar or bronchial pneumonia, complicating acute rehumatic fever or its later complications, and it should not be confused with the embolic process observed in sub-acute bacterial endocarditis. Compression of the lower part of the left lung associated with pericardial effusion may show many of the signs of a pneumonia.

Pleuritis accompanies pneumonia or pericarditis, or it may be the only demonstrable chest lesion. It may be fibrinous or may be accompanied by an effusion. Many of the "wet" pleurisies diagnosed in the past as tuberculous were probably due to "masked rheumatic infections" in the broader sense of the term.

(3) Rheumatic involvement of the other internal organs has not so commonly been observed, but now and then many of the organs may show areas of rheumatic proliferation or typical nodules. Clinical kidney damage is rare, but occasionally lesions of the glomerular vessels have been described in necropsy material. In chorea there are commonly cerebral perivascular lesions resembling the rheumatic nodule.

(4) The typical rheumatic tissue reaction has commonly been found in the joints, subcutaneous tissues, tendons, muscles and other connective tissues. In general it seems that all capillaries of a certain size may be affected. There has been considerable speculation as to the relation of the rheumatic infection to chronic arterial disease.

In conclusion we may state that the pathological process in acute rheumatic fever is a non-suppurative, proliferative or exudative lesion about the smaller arterioles and capillaries throughout the body. The symptoms and signs differ depending upon the number and distribution of these lesions, but most commonly our attention is directed toward those organs where the disturbance is clinically most easily demonstrable.

THE NON-ARTICULAR FORMS OF RHEUMATIC FEVER*

HARRY OERTING, M.D.
Saint Paul

AN IMPORTANT feature of rheumatic fever, and one that cannot be overstressed, is that inflammation about the joints is not necessarily an accompaniment of the infection. These non-articular manifestations are just as much a part of the infection as is the arthritis and they must be recognized as such and treated accordingly. Although the various clinical manifestations of the disease are quite different the underlying pathological lesion is the same.

The non-articular forms of rheumatic fever cannot be discussed as a whole, because they are different clinical entities and although it is possible to have one or more of these different manifestations present at the same time, usually, however, they appear singly.

Chorea frequently occurs without any other of the so-called rheumatic manifestations in children. One striking feature of chorea is the frequency with which one or another of the symptoms and signs of rheumatic fever may appear as isolated evidence of activity. It may be many years before the child shows enough different manifestations to establish the true nature of the disease. The symptoms though difficult to describe are never forgotten when once seen nor do they offer any difficulties to the diagnostician except in their rarer forms. According to the severity we recognize three forms: the mild, the severe, and that associated with delirium. It should be remembered that choreiform movements are increased by excitement or obstruction, entirely cease during sleep whether natural or induced by drugs, and that neither sensibility nor usually reflex activity is affected.

Several of the non-articular forms of rheumatic fever are capable of producing a great deal of pain, which is the complaint that brings the patient to his physician. Muscular rheumatism, fibrositis, or myalgia, terms that are used interchangeably, is an extremely common form of ailment. It is a condition of muscular fibrositis, due to microbic toxic absorption; to anoxemia through faulty local blood supply; or colloidoclastic tissue changes. It occurs frequently as a sequel to tonsillitis and is peculiarly likely to develop after exposure to cold or dampness, excessive fatigue, and any factors tending to reduce the body reserves. The condition may involve any muscle or group of muscles, but usually the lumbar muscles (lumbago), the muscles of the chest (pleurodynia), and the cervical muscles (rheumatic torticollis) are the ones affected. The fundamental diagnostic points are diffuse tenderness of the involved muscles; the pain is distinctly related to muscular contraction, and is absent or greatly relieved when the muscle is at rest. Except in the case of pleurodynia the amount of pain present is dependent chiefly upon the voluntary use of the muscle group affected. In pleurodynia the movement is obligatory, but, in general, spontaneous pain is relatively slight or wholly absent, though local tenderness may be extreme. The presence of tenderness over the muscles involved and the prompt pain response to movement make the diagnosis.

Care must be taken lest a persisting torticollis due to organic disease be mistaken for myalgia, which is ordinarily of but a few days duration. Pleurodynia must never be accepted as the diagnosis without a careful examination of the heart, lungs, and pleura. A strikingly similar pain may be present with intercostal neuralgia, but tenderness over the nerve and pain regardless of motion and definite points of maximal tenderness should clarify the diagnosis. The precursor pain of herpes zoster must also be kept in mind.

Neuritis often accompanies muscular rheumatism as a primary involvement or reflection of adjacent inflammatory processes. Like muscular rheumatism, neuritis usually follows exposure to cold, dampness, and excessive fatigue. Neuritis most commonly involves the sciatic and brachial nerves and is often hard to distinguish from myalgia, but the pain follows more closely the course of the nerve, is aching in character and the loss of function of the regions supplied may be more complete. Both muscular rheumatism and brachial neuritis must be differentiated from cervical rib, tumor of the neck, glands in the axillæ, aneurysm of the subclavian artery, spinal tumor and caries of the cervical vertebræ.

---

*Read before the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

Subcutaneous nodes or nodules are one of the most characteristic and diagnostic lesions found in rheumatic fever. They are small, hard, tender masses, deep under the skin and frequently cause the patient a great deal of pain. The lesions may come anywhere on the body but are usually on the lower extremities. There may be only a few nodules present or there may be many, but even one or two typical lesions are sufficient for a diagnosis. The nodules are not constant and vary from day to day or may disappear for considerable periods of time.

Pleurisy is not an unexpected accompaniment of severe polyarthritis, but it must be remembered that it may be an isolated manifestation of rheumatic fever. Although the condition is rare, cases are encountered where pleurisy precedes any other signs of infection by months. This makes it extremely difficult at times to decide whether a patient is suffering from rheumatic fever or tuberculosis. Effusion is the exception rather than the rule in this type of pleurisy and the pleuritic rub tends to come and go.

Erythema nodosum, a very acute type of inflammatory infection of the skin, is characterized by the formation of various sized, roundish, more or less elevated erythematous nodes and is attended by varying degrees of systemic disturbance. The lesions are seen for the most part on the tibial surfaces and may often be limited to these regions. Not infrequently, however, other regions are involved, more especially the arms and forearms. They are rarely present in great numbers, usually from two or three to thirty being found. They begin as a rule as deep seated nodules, rapidly growing larger and becoming elevated. In size they vary from that of a cherry to a hen's egg, are rounded or oval, tender and painful, and have a glistening tense look. They are of a bright red color that merges gradually into that of the normal skin. Later the color changes to a purple and then the various color changes of an ordinary bruise. As they develop they become soft and semi-fluctuating but they never suppurate. The condition should not be confused with the lesions of erythema induratum, which are thought to be of a tuberculous nature. Another skin lesion related in some respects to erythema nodosum is that which is described as erythema multiformi. Many authors believe these two skin diseases to be closely related.

The above mentioned conditions, with the exception of chorea, are usually found in adults. In children various mild pains are frequently present that are commonly referred to as growing pains. Without question many of these children are suffering with rheumatic fever. Many investigators consider them to have the same significance as severe arthritis and that they are to be considered as indication of active rheumatic infection likely to implicate the heart. Without doubt in many instances the so-called growing pains do not indicate active rheumatic fever. The differentiation is difficult to make, but in a child with other evidence of infection they must be viewed with concern.

In conclusion it is well to emphasize again that the non-articular forms of rheumatic fever are just as important as the articular forms and challenge our diagnostic acumen.

ACUTE BOWEL OBSTRUCTION*

Owen H. Wangensteen, M.D.
Minneapolis

THE outstanding consideration in the study of acute intestinal obstruction is the appalling mortality. Forty-one years ago, before the German Congress of Internists convened at Wiesbaden, Professor Curschmann deplored the bad results of surgical treatment and stated that medical measures gave fully as large a number of recoveries. The mortality with the conservative non-operative treatment in his clinic was 65 per cent. A year earlier at a meeting of the American Association of Physicians and Surgeons in this country, this subject was extensively discussed by Reginald Fitz and Nicholas Senn. It was brought out that the surgical mortality in the treatment of intestinal obstruction was 69 per cent. A large number of recognized authorities participated in the discussion and it was the consensus of opinion that after conservative measures had been tried for two days without success recourse should be had to surgery.

Today it is universally conceded that operation should be done for the relief of acute bowel obstruction as soon as the diagnosis can be made. Despite this general acknowledgment, cases come to operation almost as late as when it was uniformly agreed that conservative measures should be tried for two days.

Present day surgical results, though somewhat better than those obtained in the surgery of acute intestinal obstruction at the dawn of the era of abdominal surgery, exhibit no such striking improvement as can be boasted in the surgical treatment of most other acute abdominal catastrophes. Statistics from our municipal hospitals where cases of acute bowel obstruction are seen in large numbers indicate that the mortality is almost as great today as it was forty-two years ago.

C. Jeff Miller has recently published a study of the cases of acute intestinal obstruction admitted to the Charity Hospital and Touro Infirmary in New Orleans. In the five year period, immediately preceding his report, there were 343 cases with 207 deaths, a mortality of 60.9 per cent. In 1900, Gibson reviewed from various hospitals 1,000 cases of intestinal obstruction that had been subjected to surgery, with a mortality of 43.2 per cent. VanBeuren and Smith in 1925 published a collected report on 1,089 operations performed since 1900 with a mortality of 41.8 per cent.

Why do 40 to 60 per cent of patients operated on for acute intestinal obstruction die? Why does this high mortality still continue?

During the half century that has passed since the aggression of surgeons into the domain of the abdomen, strides of great consequence have been made in treatment; witness the improvement of results in the surgical treatment of acute appendicitis, acute perforations of the stomach and duodenum and other abdominal disasters of an acute nature. Today, death following an operation for acute appendicitis is synonymous with delay in the recognition of the ailment or procrastination in advising surgery. Similarly, death from perforations of duodenal or gastric ulcers signifies that an unreasonable length of time has intervened between the onset of the symptoms and the intervention of the surgeon. In 1922, Barber and Stewart reported twenty-four operations for perforated duodenal ulcer with two deaths; in the lethal cases surgical interference had been delayed for more than twenty-four hours. Today the mortality varies directly with the number of hours lost between the occurrence of the catastrophe and the closure of the perforation.

Why has not the remarkable improvement attending the surgery of other acute abdominal lesions extended to intestinal obstruction?

The results of a large number of experimental investigations have indicated that the absorption of a toxin producing profound and overwhelming effects on the organism is in large measure responsible for the mortality of the disease. Though recently several investigators have obtained results at variance with this explanation, many clinicians have been quick to seize upon the toxic factor, finding in this refuge some sol-ace for their misgivings and a satisfactory account for their poor results.

---

*From the Department of Surgery, University of Minnesota. Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

The fact remains, however, that all statistical studies indicate that there is a rising mortality in intestinal obstruction commensurate with delay in arriving at the diagnosis and procrastination in advising surgery. In cases operated upon at an early hour after the onset of symptoms, the mortality compares favorably with the surgery of other abdominal emergencies. In any number of papers on obstruction of the intestine, the difference in risk between those cases that come to operation early and those submitted to surgical intervention late is striking.

THE RISING MORTALITY OF DELAY (TUTTLE)

From onset of symptoms to operation	Total	Deaths	Per Cent
Under 6 hours	13	0	0.0
Under 12 hours	25	1	4.0
Under 24 hours	39	7	15.4
Under 48 hours	50	9	18.0
Under 3 days	70	17	24.3
Under 4 days	84	26	30.9
Under 6 days	99	37	37.4
All cases	128	53	41.3

In a consecutive series of 283 cases operated by Flint and reported by him in 1921, the mortality of operation for all cases of intestinal obstruction was only 15.6 per cent. Recently Holden has reported 135 cases of intestinal obstruction with a total mortality of 19.2 per cent. Of these 135 patients, 51 came directly to Holden. There were only three deaths in this group, a mortality of 6 per cent made possible by early recognition of the presence of obstruction and prompt surgical interference. The key to better results in the treatment of intestinal obstruction is early diagnosis.

PATHOLOGY

Classification:

From the point of view of a pathological division there are essentially two types of intestinal obstruction, viz., simple and strangulation obstruction. In the former group are included all cases in which a block in the continuity of the bowel exists; in the strangulation group are those which exhibit in addition to a mechanical block, evidence of deprivation of blood supply to the intestine.

The bowel wall above the obstructing mechanism is distended, hyperemic and thinned out in obstructions of an acute nature. Fluids and gas accumulate in the proximal segments in large amounts. Microscopically partial erosion of the intestinal villi or mucous membrane may be seen together with edema and hemorrhage throughout the layers of the bowel wall. The bowel distal to the obstruction is anatomically normal. The imprisoned loop in well-developed strangulation obstruction is infarcted, exhibiting discoloration and signs of tissue death. In simple obstruction to the continuity of the bowel, in which the dis-

CLASSIFICATION OF INTESTINAL OBSTRUCTION

A. *MECHANICAL*
  I. NARROWING OF LUMEN — SIMPLE
    1. Strictures of bowel wall
      a. Congenital { Atresia, Imperforate anus
      b. Acquired { Inflammatory, Traumatic, Vascular, Neoplastic
    2. Obturation
    3. Compression from without (Especially pelvis and retroperitoneal duodenum)
  II. ADHESIVE BANDS { Congenital, Inflammatory, Traumatic, Neoplastic } SIMPLE OR STRANGULATION
  III. HERNIA
    1. External—STRANGULATION (with only few exceptions)
    2. Internal—STRANGULATION (usually)
  IV. VOLVULUS—STRANGULATION
  V. INTUSSUSCEPTION—STRANGULATION
B. *NERVOUS*
  I. INHIBITION ILEUS (Paralytic) Adynamic—SIMPLE, OCCASIONALLY STRANGULATION
  II. SPASTIC ILEUS (Dynamic)—SIMPLE
C. *VASCULAR*
  I. THROMBOSIS AND EMBOLISM OF MESENTERIC VESSELS
  II. SEVERANCE OR INJURY OF MESENTERIC VESSELS (Operative or blunt trauma) STRANGULATION

tension is great enough to impede the free arterial inflow of blood to the intestine and egress of the venous return, the phenomena of devitalization as observed in strangulation obstruction may ensue. This occurrence is not infrequently observed in the cecum consequent upon the enormous distension of the colon occasionally accompanying carcinomatous obstruction in the sigmoid flexure. As a consequence, distension ulcers, perforation, and gangrene may follow, as are regularly observed in non-viable strangulated segments.

From the point of view of causative factors, three main types of intestinal obstruction may be recognized, viz., mechanical, nervous, and vascular. This division furnishes an adequate and satisfactory clinical classification, into one of which categories any observed variety of intestinal obstruction may be easily placed. By far the larger number of instances of obstruction are due to mechanical agents such as adhesive bands, hernia, neoplasms, intussusception, and volvulus.

Cause of death:

The discovery of Hartwell and Hoguet, that dogs administered saline subcutaneously may survive complete obstruction of the upper intestine for as long as three weeks, has lent considerable impetus to the observational study of bowel obstruction. Since these observations were made our ideas concerning the mode of death in obstruction have undergone considerable change. In this brief paper devoted primarily to the elaboration of clinical criteria on which an early diagnosis can be made, the pathological physiology of bowel obstruction can be dealt with in only a summarical fashion.

There are many features of the problem that still remain unsolved. Whether the intestinal content above the obstruction is more toxic than normal intestinal content is a debatable issue. Some experiments performed by Chunn and me indicate that it is not. Whether abnormal absorption occurs from the lumen of a distended bowel to which the blood supply is not compromised is an even more important issue. A few older well known experimenters (Enderlen and Hotz, and Clairmont and Ranzi) have shown that the obstructed bowel is less permeable to substances ordinarily absorbed than is the normal intestine; and Loucks and I were unable to obtain evidence of the absorption of histamine in simple obstruction when histamine was placed proximal to the obstruction. Though such abnormal absorption may obtain, I do not know of a single bit of evidence which indicates that in simple obstruction in which the bowel wall is viable that it does occur. There is, however, considerable negative evidence in which no proof of abnormal absorption has been obtained.

In strangulation obstruction, on the contrary, autolysis of the mucosa of the devitalized bowel quickly occurs and abnormal absorption through the mesenteric blood vessels occurs as well as via the serous surfaces of the peritoneal cavity when the strangulated segment is no longer viable.[4]

In experimental obstruction of the upper intestine in the dog, the subcutaneous administration of saline serves as an antidote not for abnormal toxins absorbed, but as a substitute for vital fluids lost by vomiting. When saline is not given, death usually occurs within 3 or 4 days and a marked increase in the blood nonprotein nitrogen, a decrease in the blood chlorides, and an increased combining power of the blood for carbon dioxide obtains (alkalosis). The administration of saline precludes the occurrence of these alterations in the blood chemistry and prolongs the life of the animal. Even a temporary administration of saline for a few days will often permit the animal to live just as long as though it were given each day.[24] Animals with a complete duodenal fistula die in a few days and exhibit the same blood chemistry changes as do dogs with obstruction at the same level.[22] The administration of saline prolongs their lives and obviates the occurrence of the blood chemistry changes.

Dogs with complete obstruction in the lower colon usually survive for comparatively long periods. In our laboratory one dog has survived such an obstruction for 50 days. The usual cause of death is dehydration and starvation. The administration of saline does not prolong their lives and blood chemistry alterations are usually not observed.

Many phases of the cause of death in acute bowel obstruction are still imperfectly understood, but it would appear that there is a fairly direct correlation between the function of the part of the intestinal tract concerned and the cause of death.[26] Obstruction of the upper intestine produces changes in the blood chemistry and saline is an effective substitute. In low colon obstructions, alteration in the blood chemistry is unusual and saline exhibits no specific value as a remedial measure; similarly in experimental obstruction of the ileum. The dogs with low colon obstructions frequently survive for long periods whereas the dogs with ileal obstructions in which a good portion of the absorptive area is blocked out usually die within a week; saline does not prolong their lives. In strangulation obstructions, saline is of no special value as a therapeutic agent. These latter observations serve to emphasize the significance of the mechanical factors in bowel obstruction.

DIAGNOSIS OF INTESTINAL OBSTRUCTION

Symptoms:

Pain, vomiting, collapse, constipation, and meteorism have been the usual standards on which judgment has been based as to whether or not obstruction of the bowel exists. All of these phenomena may be observed at some time during the course of intestinal obstruction but their importance as measures of diagnostic value must be properly appraised. In his nonpareil text on the Principles and Practice of Medicine, the late Sir William Osler says, "The sequence of gastric, bilious, and finally stercoraceous vomiting is perhaps the most important diagnostic feature of acute obstruction." That this in part is true must be freely conceded, but it is decidedly unsafe to await confirmation of this succession of events. Similarly, absolute constipation, meteorism, and collapse may establish the diagnosis, but at a time when the patient is beyond hope and remedy.

Unlike other acute surgical lesions of the abdomen, simple obstruction of the intestine produces no local signs that help to corroborate the suspicion that obstruction may be present. Appendicitis, biliary colic, and perforation in the gastro-intestinal tract occasion definite physical findings that are of immense value in deciding the nature of the condition present. The recognition of the existence of acute inflammation of the vermiform appendix without the occurrence of local tenderness and rigidity would enhance the difficulties of diagnosis enormously; the number of cases coming to operation with peritonitis would be manifoldly increased should such difficulties exist.

Undoubtedly the absence of definite local physical findings more than any other factor accounts for the delay in the recognition of bowel obstruction. Were this point continuously borne in mind, the occurrence of crampy intermittent pain without abdominal tenderness would not be so lightly considered. At the same time, the absence of local symptoms should be of distinct value inasmuch as it obtains in no other serious surgical emergency that affects the abdominal viscera.

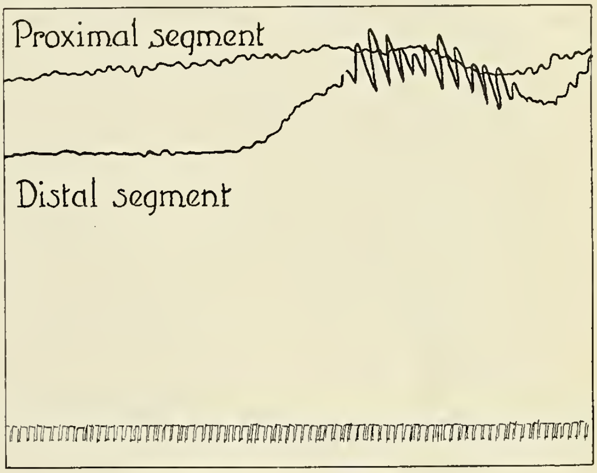


Fig. 1. Tracing made on a dog with complete intestinal obstruction of two days' duration. A balloon was inserted into the proximal segment and another into the segment distal to the obstruction. The peristaltic activity of this segment is apparent in the tracing.

Auscultation of the abdomen often lends the most valuable of all physical signs of obstruction. Visible peristalsis though regularly present in subacute and chronic obstructions is rarely observed in acute bowel obstruction. Loud peristaltic rushes like the bubbling sound produced by pouring water out of a bottle may be heard with the stethoscope when a mechanical obstruction exists. A dilated intestine in which considerable fluid and air are present is necessary to elicit these bubbling sounds. Near the point of intestinal occlusion these intestinal noises may attain an explosive force. Frequently a metallic tinkle may be heard, a sign of conclusive significance for the existence of a mechanical obstruction. As the fluid and air are carried downward toward the point of obstruction by peristaltic rushes, their progress is suddenly arrested and fluid and air which were intimately mixed in their advance tend to separate as the onward movement is halted. As the air rises to the surface, a sound like drops of water falling in a rain barrel may be heard. The metallic character of the sound has a high pitch imparted by the tension of the dilated intestine. Such sounds may also frequently be heard over the abdomen after an abdominal operation when the paresis of the intestine incident to the operation begins to be recovered from.

Mistrust in enemas:

A diagnostic criterion upon which too much emphasis has been placed in the recognition of acute bowel obstruction is the inability of the patient to expel gas or feces following the administration of an enema. There exists a general tendency to disbelieve the presence of a complete obstruction as long as gas or feces continue to be returned with the enema. Recently a patient came under my observation with enormous abdominal distension and regurgitant feculent vomiting. She had been operated upon a few weeks previously, and had persistent intermittent colicky pain and vomiting for four days before admission at the University Hospital; her physician, though suspecting bowel obstruction, had been unwilling to accept or commit himself to such a diagnosis because gas and feces continued to be expelled following the administration of enemas.

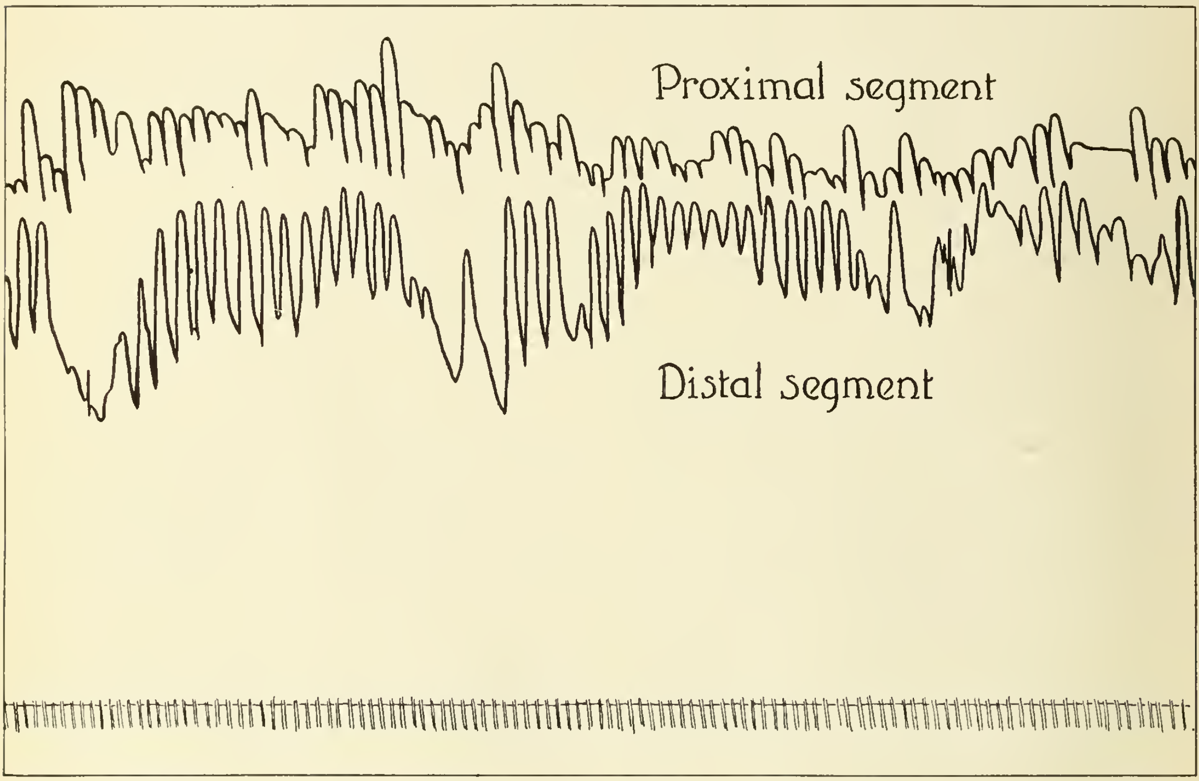


Fig. 2. A tracing made under conditions similar to those in Figure 1, with the exception that the record was obtained under spinal anesthesia. In this record the release from the inhibiting influence of the splanchnic nerves is apparent in the marked peristaltic activity of the intestinal contractions. The distal segment is fully as active as the proximal. The fallacy of considering the segment distal to the point of obstruction inactive is apparent from this tracing.

In the experimental laboratory it was found that, even after complete division and inversion of the ends of the intestine, enemas obtained gas as long as there was any present in the distal bowel.[25] By placing balloons in the bowel distal to the obstruction it was noted that the peristaltic activity compared favorably with that of the normal.[3] The bowel distal to the obstruction is physiologically as well as pathologically normal! Why shouldn't the bowel distal to the obstruction expel gas or feces following the administration of an enema? In high obstructions gas will continue to be expelled as long as rectal irrigations are given; in partial obstructions as long as some of the content of the bowel proximal to the obstruction finds its way into the distal segments gas will also continue to be expelled with enemas. Only in complete low obstructions are enemas of real value in the early recognition of acute bowel obstruction.

Value of x-ray in diagnosis:

It has long been recognized that the *x*-rays are of value in detecting bowel obstruction, but this agent has not been accorded the importance that it deserves in the diagnosis of acute intestinal obstruction.

When a single plate of the normal abdomen is made in the adult, gaseous shadows are usually observed in the stomach and colon. Gas is also present in the small intestine but the intimate admixture of gas and fluid in the small bowel precludes distinguishing the gas from its immediate surroundings. The demonstration of gas in the small intestine on the *x*-ray film is therefore decidedly abnormal and is indicative of the presence of a mechanism interfering with the normal rapid rate of transit through the small intestine. The ladder "patterns" described as the typical *x*-ray picture of bowel obstruction need not be awaited to make the diagnosis. Visible collections of gas in the small intestine of the adult are synonymous with intestinal stasis. In the experimental laboratory it has been found that definite *x*-ray evidence by the single plate method may be obtained within four or five hours after the obstruction.[28] When the plate is taken in the erect posture "fluid mirrors" can be made out in which air is layered over the fluid. These afford concrete proof of the presence of intestinal stasis. In patients too ill to stand, the same information may be obtained by taking the plate with the patient on his side.

It is to be remembered, however, that the mechanism for the production of such intestinal stasis may be either mechanical or inhibitive. The stethoscope will serve to differentiate! In the inhibition or paralytic ileus of peritonitis, auscultation reveals a relatively silent abdomen, occasionally as silent as the "stillness of the grave." In mechanical obstruction on the contrary, loud

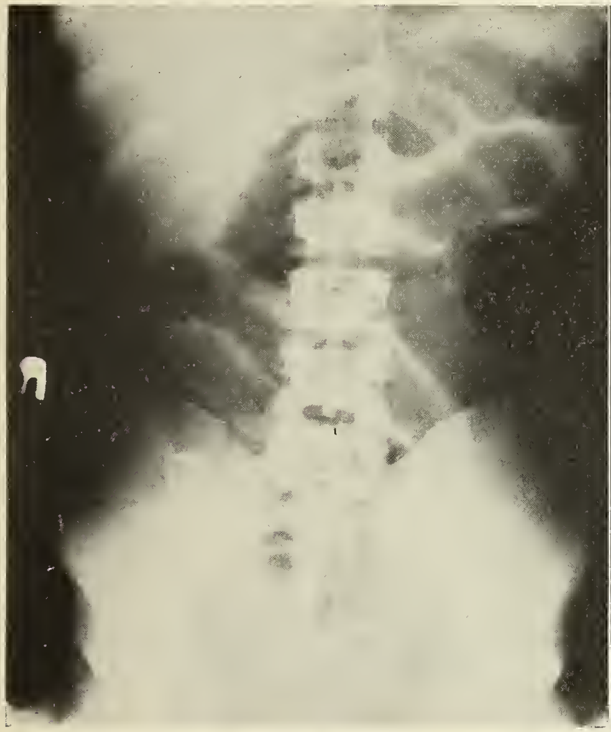


Fig. 3. A flat plate made of the abdomen in a case of peritonitis in which the entire intestinal tract is distended. In mechanical obstruction of the intestine the bowel above the point of obstruction alone is distended—another bit of evidence for the intestinal stasis being due to peristaltic ileus (inhibitive ileus) is that the intestinal wall between the dilated loops seems unusually thick in places; this appearance is afforded by the presence of exudate between the intestinal loops. This patient, of course, had abdominal tenderness and rigidity, which are almost invariably absent in simple intestinal obstruction. Auscultation of the abdomen failed to elicit loud peristaltic noises.

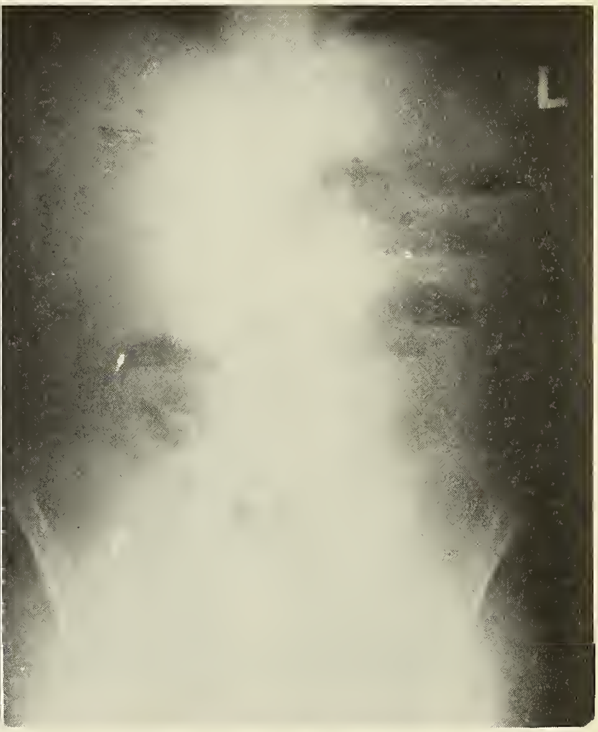


Fig. 4. Single plate of the abdomen made in the erect posture from the same patient as shown in Figure 3. The "fluid mirrors" in the small intestine indicative of intestinal stasis are well shown. The stethoscope in such cases serves as the best differential to determine whether the stasis is of mechanical or inhibitive origin.

borborygmi and frequently metallic tinkles are to be heard.

The oral administration of barium is of no value in the recognition of most cases of acute bowel obstruction and usually only contributes to unnecessary procrastination in arriving at the diagnosis.

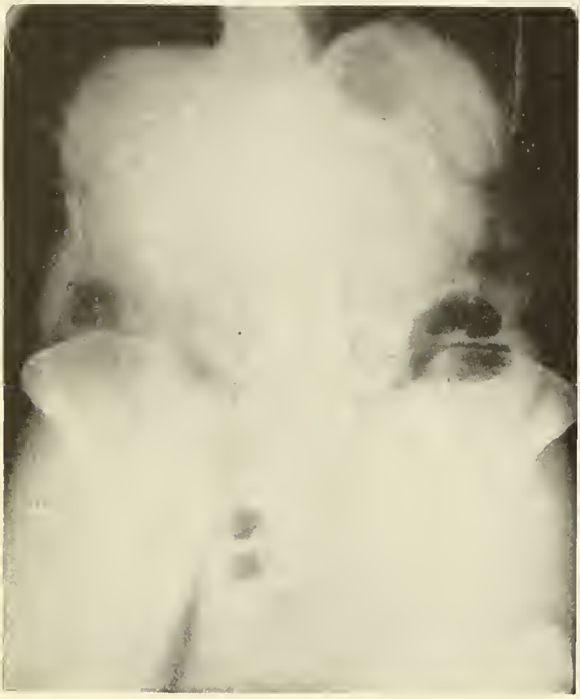


Fig. 5. A single plate taken of the abdomen of a patient who had complained of intermittent crampy pain of seven hour's duration. There had been considerable vomiting, but physical examination of the abdomen was negative. A previous enema had evacuated most of the gas in the colon; the loop on the left, however, indicates the abnormal presence of gas in the small intestine. Loud peristaltic borborygmi were heard on auscultation. The "ladder pattern" of intestinal obstruction as shown in Figure 3 is not necessary for the diagnosis of obstruction because the visualization of gas in the small intestine in the adult is significant of intestinal stasis.

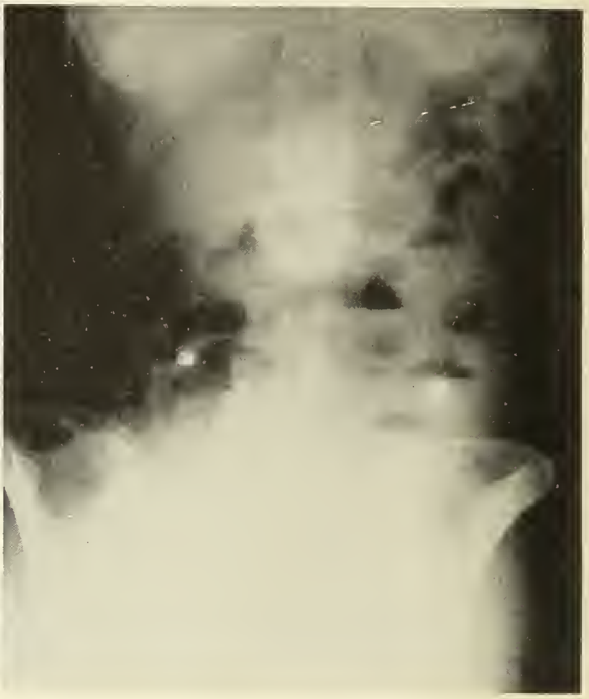


Fig. 6. Plate made of the abdomen in the erect posture in a patient with intermittent crampy pain of twelve hours' duration. The "fluid mirrors" indicate the presence of intestinal stasis. The stethoscope as well as the crampy pains serve to designate the mechanical origin of the obstruction.

General condition:

Early in the course of simple obstruction the general condition of the patient is good. The crampy intermittent pain and nausea and vomiting make him ill at ease, but he may not appear especially sick. The body temperature is normal and continues so until late in the disease, when subnormal or, less often, elevations of slight degree may be recorded. There is ordinarily but slight quickening of the pulse and no change in blood pressure until prolonged continuance of the obstruction ushers in circulatory collapse as manifested by hurried feeble pulse, cold and livid extremities, and pinched and sunken features, an anxious expression and great restlessness. Leukocytosis is absent early; later, incident to the dehydration brought about by vomiting, high leukocyte counts may be obtained with similar increases in the hemoglobin and red blood cells. Blood urea elevation, plasma chloride decrease and an alkalosis occur with regularity in high obstructions only and are not an early sign of acute bowel obstruction. Late in the disease, the tongue is parched and great thirst is complained of; the urine is scant and of high specific gravity and may contain albumin and indican. Alterations in respiration are dependent largely upon the presence or absence of distension. Late in the course of intestinal obstruction rapid superficial respirations are the rule. The sensorium remains clear until near the end when the sinister warnings of euphoria, delirium and coma portend the approach of impending death.

One of the greatest evils in the management of cases of intestinal obstruction has been the administration of morphine under the impression that no serious disorder exists. Both physician and patient are pleasantly lulled into a sense of temporary security by this disguise, and the significant warning of pain is silenced until physician and patient are rudely awakened, but often too late to undo the harm wrought by the irremediable delay. A patient presenting intermittent colicky abdominal distress without localizing findings should be watched carefully. Such a patient should be under careful hourly scrutiny and preferably in a hospital. If intermittent pain continues despite the return of gas following the administration of enemas, the abdomen should be opened. It is far better, as C. H. Mayo has so wisely said, to open an occasional abdomen unnecessarily than to await the textbook picture of intestinal obstruction. If the criteria of obstruction elaborated above are adjudged properly, such an occurrence will be most unusual.

SYMPTOMS OF STRANGULATION OBSTRUCTION

When in addition to a block in the continuity of the bowel, the intestine is deprived of its source of blood supply, a different clinical picture obtains than is observed in simple obstruction. Such a patient is more acutely ill; the pain is often agonizing in character; the pulse is usually quickened early in the course of the ailment and fever of 100°-101° is not unusual and higher temperatures may be recorded. The breathing is superficial and more frequent than normal. When a large segment of intestine is involved in the strangulating mechanism, symptoms of collapse may occur. Urinary suppression during the continuance of the strangulation is usual.

The clinical picture is determined by the degree of arrest of blood flow to and from the strangulated segment. When this is marked, symptoms of strangulation predominate; when the deprivation of blood flow is less prominent, the symptoms of mechanical obstruction dominate the picture. Every gradation from mimicry of the picture of simple obstruction to profound shock may be manifested.

In strangulation obstruction local physical findings in the abdomen are almost invariably present. Most strangulation obstructions present the features of a closed loop obstruction in which the distension of the obstructed segments progresses at a rapid rate. Consequent upon the infarction of the intestine, peritoneal irritation may usually be elicited by the demonstration of rebound tenderness. The accumulation of gas in the intestine and infarction of its wall may render the involved segment easily demonstrable by percussion and palpation of the abdomen. Wahl described this phenomenon a number of years ago and the presence of such a tympanitic mass is usually known as Wahl's sign. Such a loop may occasionally be noted on careful inspection of the abdomen. When a short segment of small intestine is concerned in the strangulation this sign may be absent due to the concealment of the involved intestine by other coils of bowel. Tenderness is usually present over the mass and the latter imparts to the palpating hand an elastic resistance. The coil is usually fixed and exhibits no peristalsis. The intestine above the obstruction distends gradually but it has been found in the experimental laboratory that the gaseous shadows in the small intestine do not appear as early in strangulation obstruction as in simple obstruction and that the X-ray is therefore not as valuable in the early diagnosis.[10a] Loud, peristaltic rushes may be heard from the contractions of the intestine proximal to the obstruction. The bowel below the obstruction being normal may evacuate feces and gas on the administration of an enema. Later in the course of the ailment an inhibition ileus as may be seen in kidney colic or peritonitis may supervene and the abdomen becomes relatively silent and enemas are not expelled.

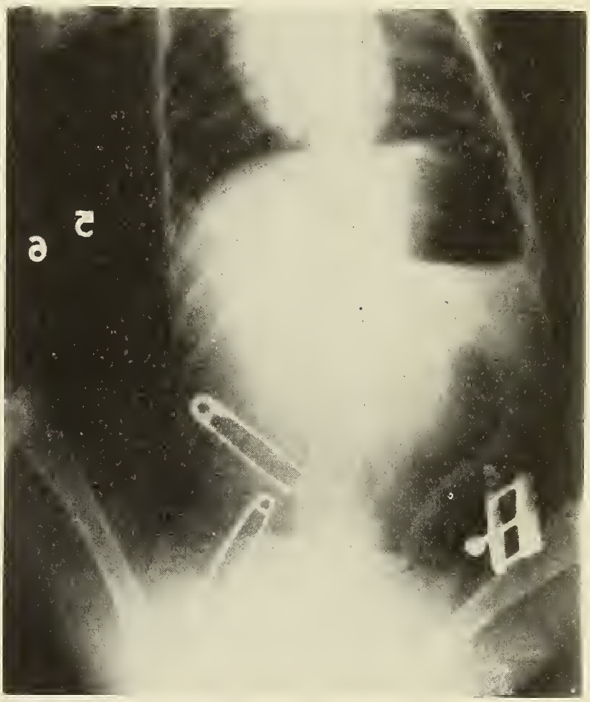


Fig. 7. Intestinal obstruction in a dog four hours after the establishment of complete obstruction in the lower ileum. Experimental study with *x*-ray of gaseous shadows in the intestine after obstruction indicates that reliable evidence can be obtained by this method within four to five hours after obstruction.

Vomiting of a reflex nature sets in early after the onset of pain but ordinarily does not continue in the same degree as seen in simple obstruction. Blood in the stool is not infrequent and its occurrence in the vomitus in high strangulations has been observed. If the course of the disease continued uninterrupted, the beginning of the end of life is heralded for the sufferer by extreme restlessness, a feeble thready pulse, a cyanotic appearance of the skin which is cold and moist with sweat, and general signs of circulatory failure. If the strangulated bowel becomes non-viable, peritonitis supervenes and hiccough frequently manifests this occurrence. It is to be remembered, however, that, although the course of strangulation obstruction is ordinarily unusually rapid owing to the deprivation of blood supply of a portion of the intestine, such is not an invariable occurrence. When the strangulating features are less prominent, the progress of the disease simulates the picture seen in mechanical obstruction at the same level, and it has not been an extremely rare observation to find a short infarcted loop as a consequence of thrombosis of the vessels in a segment of the mesentery go entirely unsuspected for more than a week's time, manifesting some abdominal discomfort, but not sufficient to warn the surgeon or patient of the lurking danger.

TREATMENT

When to operate:

The essence of the treatment of acute bowel obstruction is early diagnosis and early surgical intervention. Operation must not be deferred until the nature and location of the obstruction are known. This information can be more accurately determined at operation with less risk to the patient than if surgical interference is put off until all these queries can be satisfactorily answered. When it is appreciated that it is most important to recognize bowel obstruction early a large number of operations will be in the nature of an exploratory procedure as to the type of lesion that will have to be dealt with. Unfortunately, at the present time a large proportion of the operations performed for the relief of bowel obstruction are in the nature of resuscitations, and failures and bitter disappointments are numerous.

Preoperative preparation:

When the decision to operate has been made, no great time should be lost in preoperative preparation. During the hour that preparations are being made in the operating room, the patient's stomach should be evacuated with a tube and a liter or two of normal saline given intravenously and subcutaneously. There is an impression not infrequently encountered amongst physicians that it is more important to put off operation for eight to ten hours, during which time the patient's condition is being "built-up" with free administration of glucose and saline. Though salt and water are important agents in combating the dehydration of obstruction, it must be remembered as has already been pointed out above that only in high obstructions do these therapeutic agents exhibit the virtues of a specific.

How to operate:

When patients come to operation early the choice of an anesthetic is not so important. But to administer inhalation anesthesia to a patient with regurgitant vomiting and considerable distension, even though the stomach is emptied by a tube immediately before the administration of the anesthetic, is a hazardous undertaking.

Spinal anesthesia is the ideal analgesic agent for cases of intestinal obstruction. At the University Hospital we have employed it with complete satisfaction to the exclusion of all other types of anesthetics in intestinal obstruction except in infants, in whom local infiltration of the abdominal wall with procaine combined occasionally with light ether anesthesia usually suffices. It is somewhat outside the province of this paper to discuss the stimulating effect of spinal anesthesia on the distended bowel in paralytic ileus. No harm is to be anticipated, however, in administering spinal anesthesia because of the induced increased intestinal activity in the presence of a mechanical obstruction when immediate operation is to be performed. The early history of the employment of spinal anesthesia is a dark chapter, but recognition of the fact that the Trendelenburg position and not the upright posture protects the patient, and the introduction of ephedrin to support the blood pressure have made its use safe. Within the past year I have been enabled with its employment to operate successfully upon several late cases that would not have tolerated operation under inhalation anesthesia. Only in moribund patients is its use contraindicated.

The incision:

Unless it is definitely known just where the obstruction is, it is best to make a mid-line subumbilical incision, or a midright rectus opening of the peritoneal cavity. Most instances of small bowel obstruction can be approached satisfactorily through such an opening. In the presence of a large bowel malignancy in which a colostomy is found to be the procedure of choice, a short oblique inguinal incision can be made in either groin and the establishment of the colon decompression facilitated through the midline incision.

Location of obstruction:

In locating the point of obstruction, it is always wisest to hold up the abdominal wall first with retractors and look inside. The employment of spinal anesthesia permits easy and wide retraction of the abdominal walls and frequently exposes the site of obstruction, especially if the intestine is adherent to the parietal peritoneum. In disregarding this simplest of procedures the obstruction may not be located after diligent search with the hand in the abdomen. Short of a routine "going over" of the entire intestine, it is the most efficient method by which to locate the obstruction.

Many years ago Greig-Smith pointed out that a distended coil in the proximity of the site of occlusion will usually present itself into the wound. If the point of obstruction does not immediately come into direct vision, pursuit of the coil in the direction that presents itself least readily will usually lead to the obstruction. In addition, the intestine immediately above the point of obstruction will be hyperemic as well as dilated. When cases of intestinal obstruction are operated upon earlier, exploratory examination can be more deliberate and these signs are not as important. At least some of these cases, however, will always be with us and we must be prepared to treat them most efficiently.

Choice of procedure:

The most important decision the surgeon has to make when operating for intestinal obstruction is whether it will be possible to do the operation of election, viz., to find and relieve the obstruction and restore the continuity of the bowel or whether he must content himself with a simple drainage operation. The nature of the obstruction will in part decide this matter. In a strangulation type of obstruction in which a segment is deprived of its blood supply it is apparent that a choice of the magnitude of operation that the patient can best tolerate must not determine the procedure to be followed. Relief of the mechanical block in the bowel by enterostomy or release of the strangulating mechanism alone will not suffice; excision or exteriorization of the devitalized bowel must also be done. The continuance of such a segment in the abdomen is not compatible with recovery. The performance of a simple drainage operation in the presence of strangulation obstruction advanced to the degree of loss of vitality is therefore futile.

Immediate determination as to type of obstruction present must, therefore, be decided. The occurrence of bloody fluid in the peritoneal cavity signals the presence of a strangulation obstruction. In carcinosis of the peritoneum or in a low grade peritonitis, fluid may be present, but it is usually serous in character. An infarcted coil of intestine lends confirmation of the presence of a strangulation obstruction.

The course of action must depend solely on whether or not the bowel is viable. The return of normal color to the bowel and the return of pulsation in the vessels of the mesentery after reduction of the strangulation herald the viability of the bowel. In doubtful cases the decision as to what is best to do may be a difficult one. When the condition of the patient permits, a resection with end-to-end or lateral anastomosis is the most conservative procedure; damaged bowel proximal to the strangulation must be excised generously. It is a hazardous procedure to perform an anastomosis on a distended hemorrhagic bowel. In ill patients it is much the wiser plan to exteriorize the gangrenous bowel even in the small intestine and perform a secondary anastomosis later. If the fistula following exteriorization proves to be high in the small intestine the content from the upper loop should be collected with a catheter and put into the distal segment. The bowel wall of the strangulated segment may be edematous, but there should be no sharp line of demarcation of color between the normal and the involved intestine. When edema persists, the normal luster and sheen of the peritoneal surface of the bowel may not return promptly. Normal contractile response to pinching is absent in the nonviable bowel.

When a strangulation obstruction is not present, the surgeon in his selection of operative procedure should permit himself to be guided entirely by the patient's condition. In the early case, the operation of election may be performed, viz., the determination of the location of the obstruction and its release. In the precarious risk, the absence of a strangulation obstruction is indication for the performance of decompression by enterostomy. The determination of the location and exact nature of the obstruction in such cases is made at the risk of inviting disaster. Suppression of curiosity on the part of the surgeon at such a time will afford him an opportunity to determine later in a living patient what need be done. It should be remembered that, though the persistent existence of adhesive bands in the small intestine are potential forerunners of subsequent intestinal obstruction, such a patient may find himself so free from symptoms as to be unwilling later to submit to more surgery.

In early cases of simple obstruction, location of the point of obstruction and evisceration of the intestine in its search may be practised with safety and equanimity. Evacuation of the intestinal content by enterostomy in such cases may be dispensed with as unnecessary. All anastomotic procedures on the dilated intestine are to be religiously avoided. Tissues partially devascularized by long continued compression of the blood vessels of the bowel wall consequent upon the intestinal distension do not permit safe suture.

In postoperative obstructions, enterostomy as a single therapeutic agent serves its widest field of usefulness. Consequent upon the subsidence of intestinal distension brought about by enterostomy, the continuity of the intestine is frequently automatically reestablished and the enterostomy opening closes spontaneously when the safety vent has served its purpose upon withdrawal of the tube.

The statistical mortality in this group of cases is surprisingly high. The late recognition of the cases is in large part responsible for this high death rate, but the tendency to performance of operations of election rather than the adaptation of a procedure suitable to the precarious condition of the patient contributes in no small degree to the persistence of a forbidding mortality in this group. Evisceration of the intestine to locate the site of obstruction, or the manual manipulation and examination of long segments within the abdomen, and prolonged operative procedure incident to their performance robs the ill patient with late simple obstruction of a large margin of his chance for recovery.

Selection of site for enterostomy:

A distended coil of intestine above but near the point of obstruction should be chosen as the site of enterostomy. The deliberate performance of a jejunostomy in each case is not only unnecessary but harmful. The exponents (Bonney) of high drainage of the intestine in obstruction have insisted that the tapping of the fluid and gas containing segment is all-important. In addition, it was erroneously contended that such a vent permits escape of the most toxic intestinal content. The danger of a high intestinal fistula, per se, has been adequately demonstrated. Haden and Orr have been able to show that in the dog even partial escape of the jejunal content through catheter drainage always proves fatal. High jejunostomy therefore unless inevitable because of the location of the obstruction is to be deliberately avoided.

Technic of enterostomy:

In the performance of enterostomy fine needles and suture material, preferably silk, are to be employed. When conditions permit, it is a good plan to draw out the loop upon which enterostomy is to be done and isolate it in one or between two rubber covered clamps. Puncture of the bowel wall with a fine needle followed by withdrawal of the content of the loop with an aspirating syringe will obviate the occurrence of leakage from the stitch holes. A urethral catheter (No. 16 French) is then buried in the bowel wall by the Witzel technic. When possible the catheter should be drawn through the omentum and the latter should be fixed to the anterior abdominal wall. By placing the catheter on the stretch and making a superficial circular cut around it, about 4 or 5 inches from the eye, a groove is secured in which a fixation suture may be placed. When the traction on the catheter is released, the groove and knot in the suture are scarcely apparent. A fine chromic catgut suture is best employed to secure the catheter to the bowel wall. This refinement obviates the catheter's coming away before it has wholly fulfilled its intended purpose.

I do not believe that the employment of the Moynihan evacuation tube has any advantage; it exposes the intestine to unnecessary trauma and precious moments are wasted. When the distension is extreme, immediate evacuation of the bowel on the operating table by a trocar before suturing the catheter in place is commendable.

Postoperative treatment:

After operation the patient should be placed in bed so that respiration is unhampered. Semi-Fowler's position usually gives most comfort Physiologic sodium chloride solution is to be given daily subcutaneously with daily intravenous glucose (10 per cent) administration until the patient takes fluid well by mouth. The intake and output are to be carefully recorded; the vomitus or gastric retention recovered by expression are to be subtracted from the fluid intake. An optimum intake for a patient with intestinal obstruction in whom a considerable amount of fluid is being continuously dumped into the intestine, is in excess of the requirements of the ordinary abdominal surgical patient. In intestinal obstruction, only when salt begins to be excreted by the kidney does a diuresis occur. Three to four thousand cubic centimeters of fluid may well be utilized for the first few days. When the urine output approximates the normal, the intake may be decreased.

The patient with an enterostomy high in the intestine must be carefully watched for evidence of ill consequences from the loss of the high intestinal juices. When the effects of the obstruction have been successfully combated, the catheter may be intermittently clamped to determine the patency of the intestinal channel below. In the event that the enterostomy presents the only avenue of escape for the intestinal secretions, another catheter must be placed in the distal bowel into which the fluid collected from the oral loop may be placed, or a more direct attack on the obstructing mechanism must be made. The optimum time for such a procedure is when the patient exhibits the greatest improvement from the intestinal decompression.

SUMMARY AND CONCLUSIONS

The establishment of true criteria of bowel obstruction early in its course will help more than any single factor in bringing patients to operation at an advantageous hour and to a definite lowering of the present appalling mortality of the disease. Our textbook descriptions of intestinal obstruction should be labelled Antemortem Signs of the Disease. They do not indicate interference with the continuity of the intestinal lumen but herald impending dissolution. Regurgitant vomiting and distension must cease to be criteria awaited before a diagnosis can be made. Collapse in simple bowel obstruction should be relegated to the delineation of that antemortem status in which all vital functions rapidly depreciate and from which escape or resuscitation is unlikely.

Intermittent crampy pain, accompanied by nausea and considerable vomiting without abdominal rigidity or tenderness, is strongly suggestive of an acute block in the continuity of the intestine. The detection of loud intestinal noises on auscultation of the abdomen and the *x*-ray visualization of gas in the small intestine lend sufficient proof to make the diagnosis. The continuance of colicky pain despite the return of gas and feces on the administration of enemas constitutes sufficient indication for immediate operative intervention.

The management of cases of bowel obstruction in accordance with the principles outlined here will lead to the striking improvement in surgical results long since obtained in the surgery of other acute abdominal disasters.

BIBLIOGRAPHY

1. Barber, W. H., and Stewart, G. D.: Acute perforated ulcer of stomach or duodenum. Ann. Surg., 1922, 75:349-355.
2. Bonney, Victor: Fecal and intestinal vomiting and jejunostomy. Brit. Med. Jour., 1916, 1:583.
3. Carlson, H. A., and Wangensteen, O. H.: Motor Activity of the Distal Bowel. Soc. for Experimental Biol. and Med., 1930, 27:676-681.
4. Carlson, H. A., Lynch, F. W., and Wangensteen, O. H.: Observations on the transfusion of portal blood from dogs with intestinal obstruction. Proc. Exper. Bio. and Medicine. In press.
5. Clairmont, P., and Ranzi, E.: Zur Frage der Autointoxication bei Ileus. Arch. f. klin. Chir., 1904, 73:696.
6. Curschmann, L.: Der Ileus und seine Behandlung. Verhandl. d. deutsch. Kong. f. inn. Med., 1889, Wiesbaden.
7. Enderlen, E., and Hotz, G.: Ueber die resorption bei Ileus und Peritonitis. Mitt. a. d. Grenzgeb. d. Med. u. Chir., 1911, 23:755.

8. Fitz, R.: The diagnosis and medical treatment of acute intestinal obstruction. Trans. Congr. of Am. Phys. and Surg., 1888, 1:1.

9. Flint, E. R.: Acute intestinal obstruction: a series of 283 cases. Brit. Med. Jour., 1921, 1:729.

10. Gibson, C. L.: A study of 1,000 operations for acute intestinal obstruction and gangrenous hernia. Ann. Surg., 1900, 32:486.

10a. Goehl, R. O., Lynch, F. W., Borman, C., and Wangensteen, O. H.: Evaluation of *x*-ray evidence as a criterion of strangulation obstruction. Proc. Soc. Exp. Biol. & Med., 1930, 27:952.

11. Greig-Smith, J.: Abdominal Surgery. 6th Ed., Vol. 2, p. 665.

12. Haden, R. L., and Orr, T. G.: Chemical changes in blood of man after acute intestinal obstruction. Surg., Gyn. and Obst., 1923, 37:365-377.

13. Hartwell, J. A., Hoguet, J. P., and Beekman, T.: An experimental study of intestinal obstruction. Arch. Int. Med., 1914, 13:701.

14. Holden, W. B.: Intestinal obstruction in 135 personal cases. Arch. Surg., 1926, 16:886.

15. Mayo, C. H.: Enterostomy and the use of omentum in the prevention and healing of fistula. Ann. of Surg., 1917 (Nov.), 569.

16. Miller, C. J.: A study of 343 surgical cases of intestinal obstruction. Ann. Surg., 1929, 89:91.

17. Osler, W.: Principles and practice of medicine. Appleton Co., 8th Ed., 1918, p. 542.

18. Senn, N.: The surgical treatment of intestinal obstruction. Trans. Amer. Coll. Surg., 1888, 1:43.

19. Tuttle, H. W.: The mortality of intestinal obstruction. Boston Med. and Surg. Jour., 1925, 192:791.

20. Van Beurcn, F. T., and Smith, B. S.: The status of enterostomy in the treatment of acute ileus. Arch. Surg., 1927, 15:288.

21. Wahl, E.: Ueber die klinische Diagnose der Darmocclusion durch Strangulation oder Achsendrehung. C. f. Chir., 1889, 16:153.

22. Walters, W., Kilgore, A. M., and Bollman, J. L.: Changes in the blood resulting from duodenal fistula. Jour. Am. Med. Assn., 1926, 86:186.

23. Wangensteen, O. H., and Chunn, S. S.: Studies in intestinal obstruction. A comparison of the toxicity of normal and obstructed intestinal content. Arch. Surg., 1928, 16:606.

24. Wangensteen, O. H., and Chunn, S. S.: Studies in intestinal obstruction. Study of the cause of death in mechanical obstruction of upper part of the intestine. Arch. Surg., 1928, 16:1242-1255.

25. Wangensteen, O. H., and Goehl, R. O.: Evaluation of the expulsion of enemas a criterion of intestinal obstruction. Arch. Int. Med., 1930; 46:669.

26. Wangensteen, O. H., and Leven, N. L.: Correlation of function with cause of death at varying levels following experimental intestinal obstruction. Arch. Surg. In press.

27. Wangensteen, O. H., and Loucks, M.: Studies in intestinal obstruction. The absorption of histamine from the obstructed bowel. Arch. Surg., 1928, 16:1089.

28. Wangensteen, O. H., and Lynch, F. W.: Evaluation of *x*-ray evidence as criteria of intestinal obstruction. Proc. Soc. Exper. Biol. and Med., 1930, 27:674.

HALEY'S M-O MAGNESIA-OIL NOT ACCEPTABLE FOR N. N. R. AND MAGNESIA-MINERAL OIL (25) HALEY OMITTED FROM N. R. R.

The Council on Pharmacy and Chemistry reports that Haley's M-O Magnesia-Oil (exploited with the emphasis on "Haley's M-O") is the name under which the Haley M-O Co., Inc., has marketed a mixture of magnesia magma (milk of magnesia) and liquid petrolatum; that the firm requested acceptance of the product for New and Non-official Remedies stating that it is composed of magma magnesiæ 75 per cent by volume and liquid petrolatum 25 per cent by volume, that the Council refused admission of the product to New and Non-official Remedies because the use of a mixture of liquid petrolatum and magnesia magma in fixed proportions under an uninforming name is detrimental to rational prescribing; and that the preparation was accepted after the firm had adopted the name Magnesia-Mineral Oil (25) Haley and had revised its advertising to make it acceptable. After the Council had repeatedly been obliged to object to the advertising, the firm wrote to the Council that its attempts to meet the requirements of the Council were proving financially unprofitable and that it had decided to go back to the old name, "Haley's M-O" This means that physicians will again be asked to use this simple pharmaceutical mixture under an uninforming name. The Council directed the omission of Magnesia-Mineral Oil (25) Haley from New and Non-official Remedies and declared Haley's M-O Magnesia-Oil ("Haley's M-O") unacceptable for New and Non-official Remedies. (Jour. A. M. A., April 5, 1930, p. 1067.)

FRACTURES OF THE PELVIS*

Owen W. Parker, M.D.
Ely, Minnesota

THE occurrence of fracture of the bones in man goes back to the dawn of history; Cotton says—in speaking of ankle joint fractures—since the Nordic first wore brogans. The study of Egyptologists proves that many thousands of years ago bones were broken and tied up with splints much as is done today.

We are living in the so-called "machine age," and while the industries have surrounded the machine with every possible safety device and have trained their employees to follow the slogan "safety first," still, because of the great expansion in industrialism, trauma still causes many injuries and the surgery of trauma is receiving more attention than ever before in the history of medicine. Interest in traumatic surgery and fractures particularly has been stimulated by the compensation laws, by the greater demand that has been made on the surgeon for good results, by compensation boards, by insurance companies, by employers, by the injured themselves, by the urge of our economic system to cut down costs and return the injured to work as soon as possible and by the increasing knowledge that has come from the use of the *x*-ray.

In reviewing the last 683 consecutive fractures occurring from 1922 to 1930 in our work at the Shipman Hospital, in which the service is principally with the iron mining industry, we have had nineteen pelvic fractures. From these figures it was found that pelvic fractures have occurred in about 3 per cent of all fractures. This is about the percentage reported at the present time by others. The consensus of opinion now seems to be that fractures of the pelvis are occurring much more frequently in proportion to the total number of fractures than they did thirty years ago and we find this true in our work. In a series of 324 fractures occurring in our work before 1910 only two pelvic fractures are recorded, whereas in this present series of only a little over two times as many fractures we have had nine times as many pelvic fractures. Sir William Wheeler of Dublin states that the figures of the older authorities as Von Bergmann, Mikulicz and others indicate that fractures of the pelvis constitute only 0.3 per cent of the total number of fractures. He feels that this is much lower than our present rate.

The cause of the decided increase in the number of pelvic fractures as compared to former times, and also in proportion to the total number of other fractures, is doubtless our "machine age" mentioned above; that is, the great development of machinery in industrialism, the great expansion of industry and also the great development in rapid transportation and in this connection especially the general use of the automobile by the public. The aeroplane can be included in this rapid transportation group. Since the advent of the automobile, more women and children have suffered pelvic fractures in proportion to the total number of persons than formerly. This of course is due to the fact that formerly nearly all pelvic fractures occurred in industry and therefore mostly amongst men. Now many women and children as well as men ride in automobiles and also ride in other vehicles of rapid transportation and receive pelvic fractures in accidents of transportation and also on the streets, as pedestrians, by being struck by these rapid transports. We must not forget, however, that the industrial organizations are doing everything in their power to cut down the total number of injuries by placing all safeguards possible around all machinery to prevent men from being injured and also by training the man himself in safety-first methods so that he will be careful of his own safety; and transportation companies are doing likewise. But, we can not say as much for the people themselves who in driving their own automobiles do not show, in the mass, the same degree of care for prevention of accidents that the industries do. Automobile accidents are increasing, and whereas in former times pelvic fractures were cared for in hospitals connected with industry, now, with the automobile in such general use, any physician anywhere may be called upon to treat a severe pelvic fracture any time.

---

*Presented at the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

It is interesting to note that just as the seriousness of a head injury depends not on the bony injury or fracturing of the skull but on the injury of the contents of the skull, namely, the brain and its coverings, so the bony injury or fracturing of the pelvis is not nearly so serious a matter as the injury that may have occurred to the soft structures within and about the pelvis. Thus a torn urethra, a ruptured bladder, a ruptured kidney, a perforated intestine, a ruptured blood vessel of which the iliacs, the obturators, gluteals, and pudic are most likely to be injured, is far more serious than multiple fractures of the pelvis and separation of the symphysis pubis or sacro-iliac joints.

It is rather remarkable the large amount of fracturing and displacement of fragments that may occur in the pelvis in which an excellent functional result is obtained in spite of a poor anatomical result. Perhaps this is more true of the pelvis than of the fracture of any other bones. Nevertheless, we should strive to obtain as good anatomical reposition as possible, just as we do in all other fractures. Striving to get perfect anatomical reposition has become almost our greatest thought in treating fractures since the use of the *x*-ray. Patients and their friends seem to expect perfect end-to-end "cabinet joiners" apposition when shown an *x*-ray plate of a fracture reduction; and likewise courts and juries. This consequently has a tendency to force more attention to perfect anatomical reposition than to perfect function—perfect function, however, being the far more important consideration. Nevertheless, we may say in general in the handling of fractures, the better the anatomial result, the better the functional result. Yet good functional result may be obtained without end-to-end apposition, especially in shaft fractures, if good alignment is maintained. In fractures near joints and into joints we like to get as perfect apposition as possible.

In this series of nineteen pelvic fractures, there were two deaths (a little over 10 per cent). Other reports show a similar mortality rate. Noland and Conwell in reporting 125 pelvic fractures had twenty deaths (16 per cent). The mortality rate shows the seriousness of many of these pelvic fractures. There were seventeen males and two females. All were adults, ages ranging from nineteen to sixty-six or an average of 37.5 years. The total number of hospital days was 736 or an average of almost thirty-nine days in the hospital in the whole nineteen cases. Counting the twelve persons who actually stayed in the hospital for the full time of hospital treatment the average time was fifty-seven days, the longest 128 days and the shortest twenty-two days. Noland and Conwell in their series of 125 cases report an average of sixty-five days in the hospital, the longest period being 133 days. The average time before resuming work of twelve patients traced was 194 days. The longest time off was 437 days. The shortest was ninety-three days. In Noland and Conwell's 125 cases, the average number of days lost was 175. The total number of pelvic fractures was forty. The total number of other fractures accompanying the pelvic injury was sixteen. The sum total of all fractures was fifty-six. The largest number of pelvic fractures in one person was seven. The largest number of other fractures in one person was seven. The largest number of all fractures in one person was nine.

Classified anatomically there were the following fractures:

Ilium	10
Pubis	
Horizontal or superior ramus	10
Descending ramus	8
Body	2
Total pubic bone fractures	20
Ischium	
Ascending ramus	2
Sacrum	1
Acetabulum	1
Symphysis pubis separation	2
Sacro-iliac separation	4

The complications occurring were: ruptured kidney, injured ureter, ruptured bladder, traumatic asphyxia, fractured ribs, fractured transverse processes, spinus processes and lamina of the lumbar spine, fractured scapula, double fracture of the clavicle, spinal cord injury with paralysis, foot drop due to peroneal nerve injury, hematomas at various regions of the pelvis and back, contused ankle, scalp wound, concussion of the brain, and blood in the urine. G. G. Davis regards peroneal nerve injury as occurring originally in the lumbo-sacral cord at the pelvic brim.

The causes of injury were as follows: eight occurred in the iron mining industry due mostly to being squeezed or rolled between a car and a timber; four were from automobile accidents, three while riding in cars and one by being struck by a car; two from gunshot wounds, accidental; one by being struck by a large piece of steel in construction work; one falling from a height of thirty-five feet; one by being knocked down by a cow and jumped on; and two in the lumbering industry, one from a falling tree and one from falling down a skidway and being struck by rolling logs. Eleven were industrial and eight civilian accidents. Blood in the urine occurred five times. Noland and Conwell reporting 125 pelvic fractures noted blood in the urine in sixty cases.

Many of these patients with pelvic fractures are in a severe state of shock on admission and first need to receive treatment for this condition. Their greatest complaint is of pain. It has been stated that some of them fear they will "fall to pieces." In the severe cases the abdomen seems continuous with the thighs. The Poupart ligament demarkations appear obliterated. There will often be other injuries besides the pelvic fracture, as the injuries are usually produced by great violence, although some are produced by slight trauma and have no complications or shock and no displacement of fragments and are consequently very simple to treat. An *x*-ray should be taken as soon as possible, and since the advent of the Bucky diaphragm this has become comparatively easy. It will immediately show the bony injury and obviate the necessity of too severe a physical examination in a very seriously injured patient. It will not, however, tell us the amount of injury to the soft parts, which, after all, is the most important thing to know. A specimen of urine should be obtained at once, by catheterization if necessary. If gross blood is found, an immediate attempt should be made to find its source. It may of course come from any point of the genito-urinary tract. Blood, however, may occur in the urine without any rupture of a viscus, probably due to a traumatization of the mucous membrane along the tract. Presence of blood indicates injury but gives little help in determining the source. If the urethra is ruptured, the catheter usually meets obstruction near its membranous portion. A perineal urethrotomy should be done if the urethra is seriously injured. If the ends of the urethra can not be found or united, the bladder should be opened suprapubically and a retrograde catherization done, another catheter being passed from the distal end of the urethra. The ends of the two catheters are threaded together, and traction on one directs the other through the two portions of the urethra. The ends of the urethra can thus usually be sutured over the remaining indwelling catheter. If the ends can not be brought together, they are simply held with tension-sutures. The catheter is left in place and the urethra will usually fill in the gap. This is a similar method to the one McArthur uses in repairing a cut common duct. It is surprising how well the urethra will take care of itself if given a chance. For a number of months after healing is secured, it will be necessary to pass sounds to prevent strictures. We have used this method in repairing injured urethras although we have had no injured urethras in our pelvic fractures.

Peacock in an analysis of twenty-eight cases of ruptured urethras found 71 per cent associated with fractured pelvis. On the other hand, he found only 9.8 per cent of fractured pelves that presented rupture of the urethra.

It is not always easy to decide whether a patient has a ruptured bladder and often requires fine judgment in making a diagnosis. The diagnosis may often be made only at operation, since the evidence will usually point to the probable rupture or perforation of some viscus in the abdomen and the condition of the patient usually does not warrant prolonged study. On opening the peritoneum, blood and urine are found and a tear in the bladder exposed.

Livingston, in the American Journal of Surgery, states that bladder rupture is by no means frequent (being encountered in one in 3,000 general surgical cases) but the high mortality of this accident justifies its careful study (30 to 80 per cent mortality even under the most favorable conditions). Bladder rupture is always due to trauma but the accident is favored by vesical distention, alcoholism and pre-existing diseases of the vesical walls. It is often observed with fractures of the pelvis. Twenty-five per cent of the patients with pelvic fractures suffer simultaneous bladder injuries. Ninety per cent of cases of bladder rupture occur in males due to the more violent nature of their activities, also to the greater depth of the female pelvis and the interposition of the uterus between the bladder and the vertebral column.

Quain, in 1916, reviewed the literature and reported 126 cases of rupture of the bladder all associated with fracture of the pelvis. The first case reported occurred in 1795. The patient, a man, was crushed under a wall and as a result there was a rupture of the bladder and the symphysis pubis was separated. The patient died 56 hours later. Autopsy showed infiltration of urine and peritonitis.

When bladder injury is suspected and the patient has a strong desire to urinate but is unable to do so, immediate catheterization should be done. If no urine returns, it may be due to an anuria from shock or to an intraperitoneal rupture with escape of urine into the peritoneal cavity. Usually the catheter passes freely through the urethra but only a small amount of urine is obtained with some blood, or more bloody urine may be drained away than could have been contained in the bladder, the urine having poured back into the torn bladder from the peritoneal cavity. In making a diagnosis some authorities suggest that a measured quantity of fluid should be injected and the fluid returned carefully noted and checked. There are disadvantages to this procedure. If the injected fluid leaks through a rupture into the peritoneal cavity, the desired information is obtained but the shock from which the patient suffers becomes more pronounced. If it returns in full quantity, it may have passed through an extraperitoneal rupture into the space of Retzius and returned with no appreciable diminution of quantity. Under such circumstances, the surgeon is deceived. In bladder ruptures either extra- or intraperitoneal, if the rupture is very small, a considerable quantity of urine, probably blood stained, will be recovered by catheter, as very little may leak out and no information as to the presence or absence of the rupture will be definite. Cystoscopic examination will assist in these cases. Injection of 150 to 200 c.c. of air into the bladder, followed by an *x*-ray, has been advocated. If air has passed into the peritoneal cavity it will form a bubble in the subphrenic area and if not visualized an intact bladder is presumed.

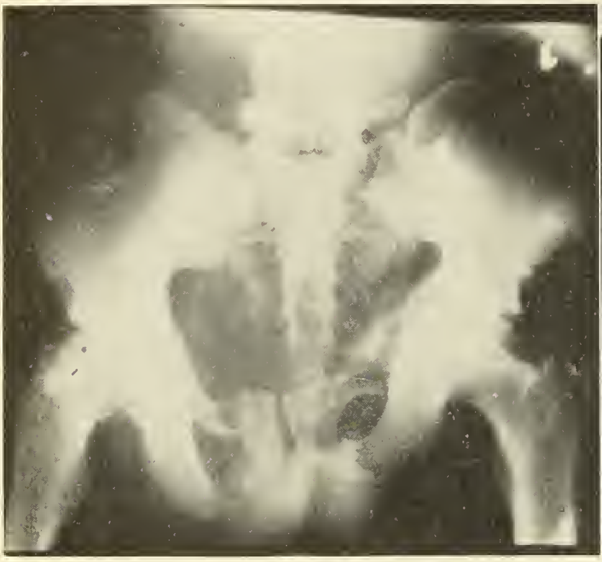


Fig. 1. Case 4.—J. V. Fracture of the left ala of the ilium; fracture of the horizontal ramus of the left pubis; fracture of the horizontal ramus of the right pubis; fracture of the descending ramus of the right pubis; fracture of the transverse processes of the two lower lumbar vertebræ. Ruptured bladder—death.

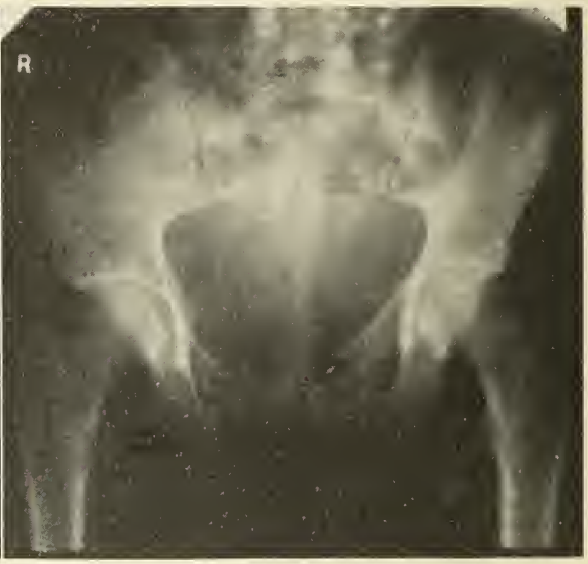


Fig. 2. Case 6.—E. M. Fracture of the horizontal ramus of the right pubic bone; fracture of the descending ramus of the right pubic bone; fracture of the horizontal ramus of the left pubic bone; fracture of the descending ramus of the left pubic bone. Later complicated by an attack of acute appendicitis—operation—recovery.

Rupture of the bladder is often produced by a spicule of bone, perhaps more often than by the bursting effect of the trauma. This was true in Quain's report of 126 cases. The rupture is either intra- or extraperitoneal. If intraperitoneal, which is more common, it is usually near the fundus or posteriorly. The urine escapes either into the space of Retzius and percolates toward the anterior wall or, as is more often the case, it escapes into the peritoneal cavity. In operation, the abdominal cavity is opened, all urine and blood removed from the cavity, the bladder sutured tightly with catgut (silk has also been used), and a self-retaining catheter is left in the bladder. Sometimes it is necessary to drain the abdominal wall down to the suture line of the bladder. Suture of the bladder has been considered unnecessary by some authorities if the bladder is thoroughly drained. We would ordinarily prefer suture. If the tear is extraperitoneal, it is usually on the anterior surface, either in an accessible portion or down below in the neighborhood of the trigone and post-prostatic area, and if not drained by immediate operation urine will eventually come to the surface through the inguinal canal, the femoral opening into the perineum or prevesical space. In our series there was only one case of proven rupture of the bladder.

In only one of our cases did there appear to be injury to the kidney. We thought the patient probably had a rupture of the kidney. This diagnosis was based on exclusion of the urethra and bladder, the presence of nearly pure blood in the urine, the large mass that formed in the region of the kidney which seemed to be due to hemorrhage, the history of the injury (the patient being struck in the region of the kidney by a heavy piece of steel), and the *x*-ray findings of fracture of the twelfth rib and of the ilium on the same side. We did not operate because, after treatment of the shock, the patient within a few hours began to improve and at no time did he show signs of infection or extravasation. No cystoscopic examination was made, but later a functionless kidney was found by the urologist, absolutely no urine coming from the ureter, the ureter being closed at its junction to the pelvis of the kidney. It was therefore assumed that the ureter was injured at the time and in healing had closed completely and thus an auto-nephrectomy had occurred, the result a functionless kidney.

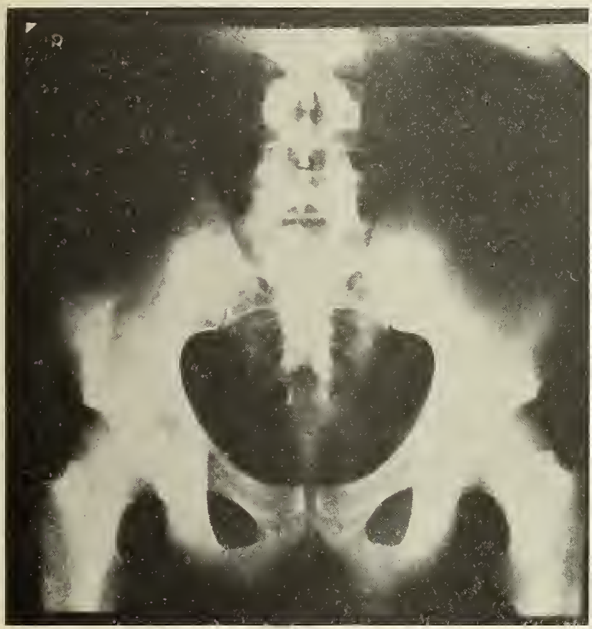


Fig. 3. Case 7.—A. L. Fracture of the right crest of the ilium; fracture of the twelfth rib on the right side with injury to the right kidney and ureter.

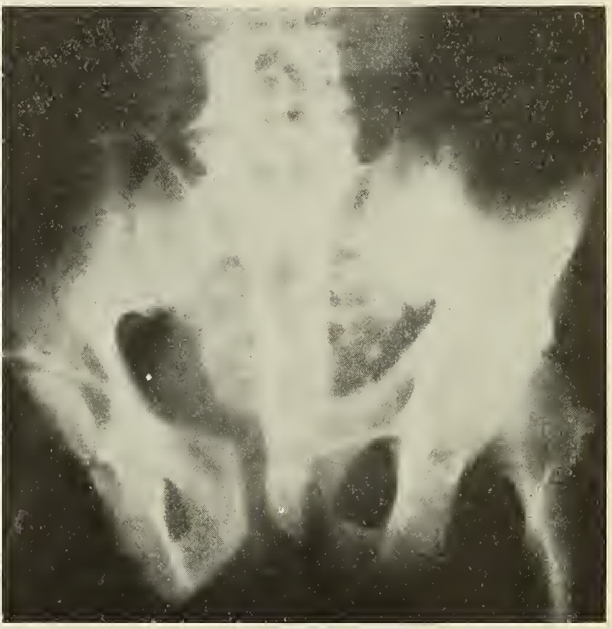


Fig. 4. Case 9.—A. S. Compound fracture of the right crest of the ilium with displacement; separation of the symphysis pubis; separation of right sacro-iliac joint. Blood in the urine.

The principal symptoms of rupture of the kidney are hematuria, pain and a mass in the region of the kidney. The mass is usually due to the bleeding from the kidney. The rapidity with which it increases in size gives a rough estimate of the severity of the kidney hemorrhage. When the kidney is injured, such as in contusion or rupture, the question arises as to what other organs have been injured, if any, and whether or not the kidney injury demands operative treatment. After ruling out injury to the urethra and bladder, the two outstanding indications for operation are hemorrhage and infection. In the period immediately following the injury, one seeks, especially, any evidence pointing to severe and continuing hemorrhage. Repeated examinations of the blood pressure, hemoglobin and counts of red and white cells of the blood are of assistance in determining the continuance of hemorrhage, as stated in Dean Lewis's Surgery. Drainage for infection of hematoma or extravasation of urine into the lumbar gutter, and suture of the kidney or nephrectomy for control of hemorrhage, are the usual operative procedures when operation is decided upon.

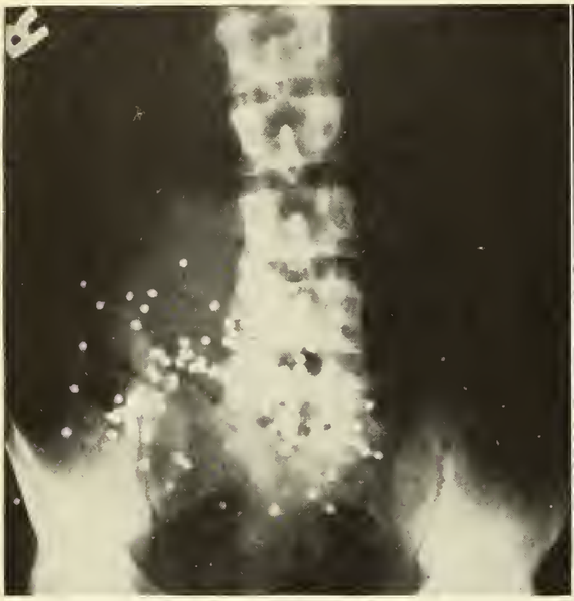


Fig. 5. Case 14.—M. B. Gunshot fracture of the pelvis: Fracture of the left ilium—injury to sacro-iliac joint; fracture of two transverse processes of the lumbar vertebræ.

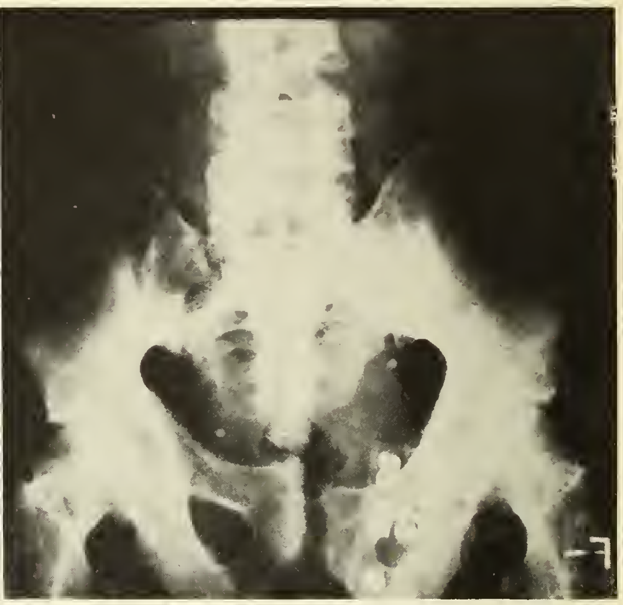


Fig. 6. Case 15.—G. J. Separation of the symphysis pubis; separation of the right sacro-iliac joint. Traumatic asphyxia.

Bellevue Hospital, New York City, reports from 1914 to 1929 fifty-two cases of kidney injury, complicated in only one instance by pelvic fracture. Of these fifty-two cases, twenty-eight were simple contusions; six of these were operated on and all got well. There were eighteen cases designated as laceration or rupture of the kidney. The mortality record shows the seriousness of kidney injury as a class. Eighteen of the fifty-two patients (34.6 per cent) died; thirteen died without operation; five died following operation. Of the eleven cases operated on for contusion or rupture, six lived. Nephrectomy was done five times. There is probably no fixed rule to follow in these cases. Each case must be treated on its merits. The surgeon should stand ready to do an exploratory operation in the presence of alarming or continued hemorrhage in an effort to control it. Kidney suture or nephrectomy may be required.

Following the treatment of the complications of pelvic fractures, the patient should be placed in bed and treatment of the fracture itself begun. In most of our cases, this was done by simple rest in bed flat on the back, using sandbags for support to the legs and pelvis. In some of the cases, we have used, in addition, traction with abduction, especially if there was upward displacement; and an encircling belt which could be tightened gradually, especially in sacro-iliac and symphysis pubis separations. Adhesive strapping was also employed.

We have used the plaster cast in only one case, in which the acetabulum was fractured, and in this case traction was employed previous to the application of the cast. This had to be removed as it was not satisfactory and traction again resorted to with suspension of the leg. We did not operate on any of our cases. In one case in which there was bad displacement of the fragment of the horizontal ramus of the pubis we felt that a better anatomical result might have been obtained by operative replacement, but functionally the result is good. At present we are using a fracture bed with overhead frame which allows extension in all directions and also overhead suspension. It has also a trundle-bed arrangement for raising and lowering the patient for use of a bed-pan, caring for the patient's back and other necessary nursing care without necessitating turning or lifting or disturbing the patient in any way or moving the extension or fractured parts, the patient being suspended by canvas cross pieces. We feel that this is very valuable in the treatment of pelvic fractures, fractures of the spine, fractures of the neck of the femur and all other femur fractures. Of course, the bed can be used in any fracture that requires extension and rest in bed.

Noland and Conwell, who recently reported 125 pelvic fractures in their work with the Tennessee Coal, Iron and Railroad Company, treat their patients by an overhead pelvic suspension frame. Suspension is obtained by a canvas sling or hammock which extends from the upper third of the thighs to the lower dorsal region. We quote from them as follows:

"This hammock acts as an immobilizing factor because of the lateral compressive action on the pelvic girdle, the force being approximately equal to the body weight. This force is continually in action and as relaxation of the muscles take place there is a constant disposition of the displaced fragments to fall into their natural position. As a general thing, marked relief of pain is noticeable within the first few hours following the application of the pelvic hammock.

"Suspension is supplemented by traction on the legs and thighs with about fifteen to twenty degrees of abduction at the hip. This relieves the marked spasm of the strong adductors, prevents scissoring of the thighs, tends to pull the fragments back into place and prevents the limited abduction so commonly observed following these injuries. Sufficient weight is used on the hammock to counterbalance the weight of the patient but not enough to raise the patient completely from the bed. Weights used for leg traction vary from four to eight pounds. A spreader is used in certain cases to prevent too great a lateral pressure by the hammock. Lateral pressure of the hammock may at once cause an overlapping at the point of the fracture unless it is offset by the intelligent use of the spreader. The degree of lateral pressure can easily be governed by the lowering or raising of the wooden spreader. The spreader should be the exact width of the individual's pelvis within the canvas sling. The use of the spreader should be routine treatment, except in cases in which a separation of the symphysis is present. In such cases a high degree of lateral pressure is necessary, and is obtained by the use of the hammock without the spreader."

Noland further states this method of treatment gives high degree of ease and comfort to the patient, greatly simplifies nursing care, prevents a certain amount of muscular atrophy, allows for improved circulation throughout the pelvis, and allows easy access for care and dressings when the soft parts have been injured. He says:

"We believe that these fractures should be treated by traction and suspension for an average period of at least forty-two days. At the end of this time, the hammock is removed and the patient is allowed to move around about in bed for another week. The pelvis belt is applied immediately after the removal of the hammock. At the end of the seventh or eighth week, the patient is allowed out of bed and begins weight bearing with the aid of crutches.

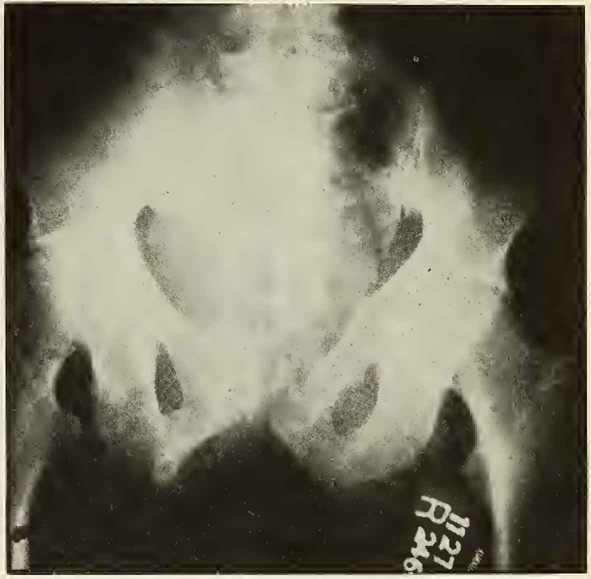


Fig. 7. Case 16.—J. N. Fracture in two places of the right horizontal ramus of the pubis; fracture of the descending ramus of the pubis; fracture of the left pubic bone through the body; fracture of the sacrum at its lower right side near the sacro-iliac joint.

As convalescence proceeds, daily hot tub baths and local heat are used. The patient should be kept under close observation for a long period. Judgment should be used in forcing these men back to work. In our early experience we were inclined to return them to work as early as possible, but frequently found that after a few days at work they were inclined to develop muscular spasm of the back and thighs, which necessitated return to bed with consequent lowering of morale. We attempt at all times to assure the patient that he has excellent prospects of recovery and that the long period of bed treatment is not because of the expectation of a permanent disability but to enable the fractures to be immobilized long enough for union to take place and healing of the soft structures."

From our own experience, the excellency of this method as outlined by Noland and Conwell appeals very strongly.

We quote from H. Winnett Orr of Nebraska, regarding his treatment of fractured pelvis, as follows:

"It is quite important in these injuries, as in most other fractures, to secure reposition of the fragments and to maintain this position during the entire period of healing. Wide abduction and traction (Whitman position) are essential because they give just the kind of pull on the attached ligaments that will draw the injured parts of the pelvis into correct position. Fixed traction in a cast is the best method for maintaining length, and, finally, a double spica cast is required to immobilize the pelvis. Our technic in such cases is as follows:

"The traction is applied when the fracture is reduced and so immobilized or fixed in immobilizing apparatus that it and the fractured extremity remain undisturbed and unaltered until at least preliminary healing has taken place. The exact technic as employed by us is the following:

"Moleskin adhesive traction straps are applied to the limb, 3 inches wide and varying in length for fractures of the leg or thigh. The frayed ends of a strong, pliable rope are sewed into the distal ends of the straps to be used for traction purposes. The straps are applied to both sides of the limb well up to the site of the fracture and bandaged into place with muslin bandage.

"The patient is anesthetized on a fracture table; traction is instituted by a muslin bandage about the foot and the rope ends are attached to the traction device by which a pull is made and continued until the limbs are of equal length. The cast is applied in the usual manner, as far down on the extremity as the ankle. After the plaster is sufficiently set, traction having been continuously maintained by the foot bandage, the traction straps are cut off from the holding device, turned back against the leg portion of the cast, and embedded in the cast by several turns of plaster bandage, thus anchoring them and maintaining traction. When the plaster is set, the muslin bandage anchoring the foot is removed, and the foot wrapped with sheet wadding, and a cast applied with the foot at a right angle to the leg. Complete recovery and ability to be up and walk about may be expected by this method in 8 to 12 weeks."

In conclusion, let us reiterate that in pelvic fractures, as in skull fractures, the treatment of greatest importance is the treatment of the injury to the important soft structures and that we must diagnose these serious injuries to important soft structures early if we are to give life saving medical and surgical treatment at the right time, and that pelvic fractures with their accompanying serious injuries to important organs and high mortality rate will continue to increase unless the industries, the transportation companies and the people themselves in driving their own automobiles do everything possible to cut down the number of accidents.

CASE REPORTS

Case 1.—J. P., male, aged 21, single, was injured April 11, 1922. He was squeezed between a motor car and was rolled against a timber in an iron mine. The injury consisted of an excoriation of both hips just below the anterior inferior iliac spines. *X*-ray showed fracture across the right ilium from the anterior inferior iliac spine to the sacro-iliac synchondrosis without displacement. He was brought to the hospital in an ambulance. He remained in the hospital until May 19, 1922, thirty-eight days. He was confined in bed flat on his back for three weeks. Sandbags were used as supports. At the end of three weeks, he was allowed to get up on crutches and walk around the ward. At the time he left the hospital, he was able to walk outdoors on crutches. He was able to do light work on August 1, 1922, being disabled 111 days. He has worked in the mine constantly ever since at his regular job, function good.

Case 2.—C. N., male, aged 36, single, was injured May 25, 1922. He was brought to the hospital in an ambulance. He was injured in an iron mine by being squeezed between two cars. *X*-ray showed the following fractures: (1) fracture through the left ilium; (2) fracture through the descending ramus of the pubis. He was put to bed in the hospital flat on his back, the pelvis supported by sandbags. He complained at first of considerable pain in the pelvic region, pain on urination, and also some pain in the abdomen in the region of the stomach. There was no blood in the urine. He remained in bed in the hospital until July 3rd, when he was allowed to get up on crutches. After that he was up nearly every day on crutches and was discharged from the hospital on July 11th, having been in forty-seven days. He returned to work on October 6, 1922, disabled 134 days. At present time, he is working in the mine at his regular work. He feels well and function is excellent.

Case 3.—F. K., male, aged 37, married, was injured June 22, 1922, by falling down a skidway and being struck by rolling logs. He was brought to the hospital in fair condition. *X*-ray showed: (1) fracture of the horizontal ramus of the left pubis; (2) fracture of the descending ramus of the left pubis. He was put to bed in the hospital flat on his back with sandbag supports. He remained in the hospital forty-two days. He returned to work in one year, with a good functional result. He has been able to work since, but sometimes has a little pain and a slight limp.

Case 4.—J. V., male, aged 35, married, was injured August 18, 1922, in an iron mine by a cave-in. The patient was brought to the hospital vomiting and in a severe state of shock. He was at once treated for shock and catheterized, very little bloody urine being obtained. The abdomen was tense and hard; rupture of bladder was suspected. *X*-ray of the pelvis disclosed the following fractures: (1) fracture of the left ala of the ilium; (2) fracture of the horizontal ramus of the left pubis; (3) fracture of the horizontal ramus of the right pubis; (4) fracture of the descending ramus of the right pubis; (5) fracture of the transverse processes of the two lower lumbar vertebræ. He also had a hematoma in the right groin and a contusion of the right thigh. After two or three hours, when there was slight improvement in his condition, he was prepared for operation and taken to the operating room. The abdomen was opened under local anesthesia. Blood and urine were found in the abdomen and an intraperitoneal tear in the fundus of the bladder, transverse and about one inch from side to side, was located. The mucosa was closed with catgut and the bladder wound closed by three rows of Lembert's silk sutures. A drainage tube was left in the abdomen down in the pelvis behind the bladder and a catheter was placed in the bladder through the urethra and secured in place. His condition was not materially worse after the operation. He failed to rally, however, after the shock of his injuries, gradually failed and died at 7:20 A. M., August 19, 1922, about thirteen hours after his injury. We did not feel that the operation in any way hastened his death.

Case 5.—J. O., male, aged 66, widower, was injured on January 25, 1923, while working in the woods, by a tree falling and striking him. He was brought to the hospital. His radial vessels were sclerotic, there was marked ecchymosis over the back and right hip posteriorly, crepitus marked over the crest of the right ilium, but no injury to the bladder, the urine being clear and normal. *X*-ray showed fracture through the crest and thin flat portion of the ala of the right ilium. He was given first aid and then sent to his doctor at his home in another town. No further history was recorded. Presumedly, he made a complete recovery.

Case 6.—E. M., female, aged 23, married, was injured on June 2, 1923, by a fall of thirty-five feet from a lookout tower. She and her husband, a forester, were in the tower when it was blown over by a windstorm. She was unable to walk but could crawl and helped her husband get out of the wreckage. He, though injured, sustaining a fractured shoulder, took a boat and went for help, leaving her alone. The accident happened at 1 P. M. They arrived at the hospital at 8 P. M. On arriving, she was put to bed and treated for some shock. It was necessary to catheterize her; the urine was examined and no blood was found. The patient was very tender over the lower abdomen. It was felt that she might have a perforation of the bladder or bowel. She did not vomit. *X*-ray picture taken showed a bilateral fracture of the pelvic bones, namely: (1) fracture of the horizontal ramus of the right pubic bone; (2) fracture of the descending ramus of the right pubic bone; (3) fracture of the horizontal ramus of the left pubic bone; (4) fracture of the descending ramus of the left pubic bone. Position was good and the patient was put to bed flat on her back and supported by sandbags. For several days following injury she had rather stormy symptoms, her lower abdomen being quite distended and

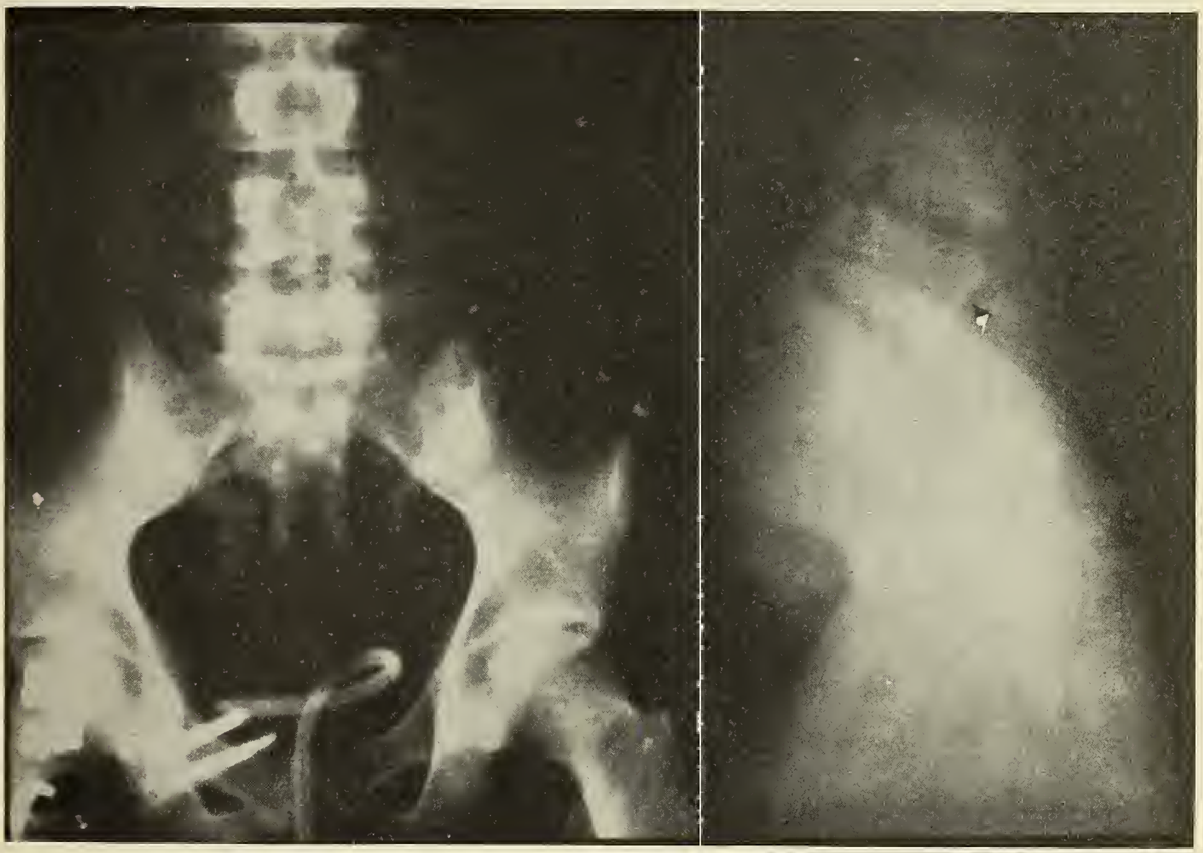


Fig. 8. Case 18.—M. R. Gunshot wound fracturing pelvis and spine with cord injury. Recovery.

very tender but not markedly rigid. She had to be catheterized several times but no blood was found in the urine. Bowel movement was obtained by enemas. Symptoms gradually subsided but there was considerable ecchymosis in the perineal region; there was also a contusion of her left ankle, but *x*-ray showed no fracture. She was sitting up a little at the time before she left the hospital July 31, 1923, after a stay of fifty-nine days. She went home and went to bed. She was at home until August 17, 1923, when she had an attack of acute appendicitis. She was brought to the hospital and operated immediately, remained in the hospital eight days. She gradually recovered and began to walk and was able to attend to her household work on November 15, 1923. At present, she is doing her household work, feels well and has no pain or disability, function excellent.

Case 7.—A. L., male, aged 19, single, was brought to the hospital September 17, 1923. He had been injured in the region of the right kidney and right pelvis by being struck by a heavy steel bar while doing construction work. The patient was pale and cold, with a rapid, weak pulse and in a state of severe shock. All movements gave him great pain. He constantly moaned and seemed unable to answer questions. An *x*-ray taken at once of the lumbar spine and pelvis showed a fracture of the right crest of the ilium and fracture of the twelfth rib on the right side; no injury to the vertebra was shown. There was a considerable tumor-like swelling on the right side in the region of the kidney and lower back. The patient was catheterized and almost pure blood was obtained. It was thought the patient had an injured kidney, probably ruptured, with hemorrhage into the bladder and tissues surrounding the kidney, and a severe contusion of the back muscles. He was in poor condition for operation and immediate operation was not thought necessary. He was put to bed and treated for pain and shock. He had a rather stormy convalescence but gradually improved. No operation was performed. Blood disappeared from the urine entirely in about a month. His injury consisted of a fracture of the crest of the right ilium, fracture of the twelfth rib, probable injury to the right kidney (rupture) and ureter, severe contusion of the right side of the back, kidney region and lower back. He was up in a chair on October 24, 1923, walked about on crutches on November 2nd and left the hospital November 9th, being in the hospital for a period of fifty-eight days. Finally, he recovered with some deformity of the crest of the right ilium and a functionless kidney as reported by cystoscopic examination by a urologist. He is now working on the surface at the iron mines doing regular work, is well and healthy, does not complain of any pain or difficulty, walks well, has since married and has one child.

Case 8.—A. H., male, aged 47, single, was brought to the hospital April 29, 1924. He had been injured in an iron mine by being squeezed between a car and a post. He was in a bad state of shock. Examination showed severe contusion of the chest with traumatic asphyxia, his face being purple and eyes bloodshot. *X*-ray showed fracture of five or six ribs with considerable displacement and fracture of the left scapula with some displacement, fracture of the descending ramus of the pubis with no displacement. It looked as though he would live only a few hours. His pelvic injury was not nearly as serious as his chest injury. There was no blood in the urine. The first treatment was directed toward saving his life rather than attempting in any way to replace the broken bones. He gradually improved after a stormy convalescence. He left the hospital June 9, 1924, being able to walk on crutches, after forty-two days in the hospital. His back was very weak. He began light work March 9, 1925, being disabled 313 days. He went to his home in Finland, never quite fully recovered so that he could do his former work. The chest injury was the cause of this disability and not the pelvic fracture.

Case 9.—A. S., male, aged 54, married, was injured in an iron mine September 3, 1925. While stealing a ride in a tram car, he was struck by an overhanging chute. He was brought to the hospital in a state of shock, with considerable bleeding from an external wound over the right crest of the pelvis. *X*-ray showed the following: (1) compound fracture of the right crest of the ilium with displacement; (2) separation of the symphysis pubis; (3) separation of right sacro-iliac joint. Catheterization showed bloody urine. During the first week, he had to be catheterized at times and at times passed urine, usually with blood. The urine gradually cleared. Bleeding was probably due to the mucous membrane injury of the bladder and possibly other portions of the genito-urinary tract. He was treated by being placed flat on his back in bed and as soon as he was over his shock a wide canvas belt with buckles was applied, extending over the trochanters of the hip and brought together gradually by tightening up daily to bring the pubic bones in apposition and support the sacro-iliac joint. Fairly good apposition and position was obtained. He was in the hospital from September 3 to December 12, 1925, a total of 100 days. He commenced to move around some and walk on December 5th. At present he is alive and well and is working in the mine as a bell ringer. Before the injury he was a trammer. He started light work September 7, 1926. He complains of pain at times in the perineal region. He has had some permanent partial disability.

Case 10.—W. R., female, aged 39, married, was injured November 29, 1925, in an automobile accident. She was brought to the hospital semiconscious, cold and clammy, with a very weak pulse and in a state of shock. She had a large scalp wound on top of her head with considerable undermining of the tissues. The scalp wound was opened and explored; no skull fracture was found. There was concussion of the brain. She had a double fracture of the right clavicle, a small central piece about two inches long being entirely broken out and dislocated as shown by *x*-ray. She had numerous bruises over the body and an injury in the region of the right hip and pelvis. *X*-ray taken of lumbar spine, pelvis, and hip showed fracture of the right ramus of the ischium, but no displacement. She passed blood in the urine for a week or ten days. The patient was put to bed in the hospital flat on her back and kept quiet. She recovered from the shock and went to her home on a stretcher December 8, 1925, having been in the hospital eight days. She was put to bed at home and remained in bed three months and then started to walk. At the end of four months, she began housework. She is now feeling well and has no trouble from the injury.

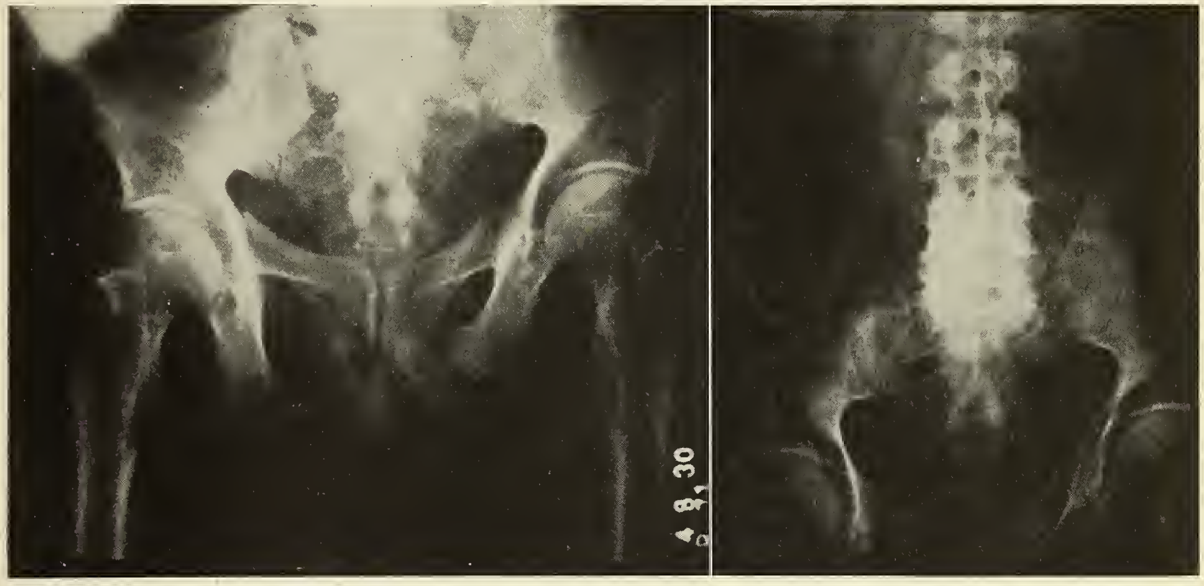


Fig. 9. Case 19.—J. S. Fracture of the horizontal ramus of the left pubis at its outer end and also at its inner end; fracture of the body of the left pubic bone; fracture of the descending ramus of the left pubic bone; fracture of the horizontal ramus of the right pubic bone at the outer end; fracture of the descending ramus, right pubis; some separation of the left sacro-iliac joint; fracture of the transverse processes of the lumbar spine. Death in three hours.

Case 11.—M. D., male, aged 28, married, was injured December 15, 1925, in an iron mine by being squeezed between a car and timber. The injury consisted of only a simple, irregular fracture of left ilium without displacement. He was put to bed in the hospital flat on his back with adhesive strapping of the pelvis. He left the hospital December 24, after nine days in the hospital. He went to his home to remain in bed. He was able, however, to walk around with crutches. January 25, 1926, he was walking with one crutch, but had some pain when walking. By February 8, 1925, he was doing well, walked without crutches but with a limp. April 5, 1926, he returned to work at the mine on light duty. At present he is well and healthy, doing a regular miner's work, with no pain or trouble from the fracture. He remained at home for a total of 110 days.

Case 12.—H. M., male, aged 46, single, was brought to the hospital, having suffered an injury in an automobile accident September 29, 1926. He complained of pain in the chest, difficulty in breathing, and his eyes were bloodshot and his face blue, somewhat like a traumatic asphyxia. He also had a pelvic injury. *X*-ray showed fracture of the descending ramus of the right pubis. He was put to bed in the hospital for a period of ten days, when he was allowed to go home and remain in bed. After he went home, he was in bed most of the time but sat up every day. Finally he began walking and went to work about four months after the injury. At present he is working in the mine and has no trouble nor disability.

Case 13.—R. G., male, aged 29, married, was injured April 4, 1927, by being squeezed and rolled between cars and timber in a mine. He was brought to the hospital in great pain and in some shock. *X*-ray showed fracture of the right ilium extending from the crest well down into the bone. General position was good. There was a large hematoma over the site of the injury. He was put to bed in the hospital, treated for mild shock, and sandbags were placed along the side of the pelvis and leg for support. The position of the fragments seemed good and no attempt was made to improve it. The patient did well in the hospital and was discharged April 26th, having been in the hospital twenty-two days. He was walking on crutches when he left. He was discharged for work July 6, 1927. At present he is working in the iron mines and has no trouble whatever.

Case 14.—M. B., male, aged 22, single, while out hunting November 27, 1927, was accidentally shot by the discharge of his companion's gun. He was brought to the hospital in a state of shock. Examination showed a young, healthy, robust man. He had lost considerable blood but his pulse was fair. He was in considerable pain, and a large gunshot wound was evident about 3 inches from the lower lumbar spine and 1 inch above the ilium in the left loin. *X*-ray showed a large number of shot buried and a fracture of the left ilium near the crest extending down to the sacro-iliac joint; also two transverse processes of the lower lumbar vertebræ fractured. The wound was cleaned up. Large numbers of shot, paper wads and other foreign material were removed. As there was considerable bleeding, the wound was packed with iodoform gauze. Patient was given 1,500 units of anti-tetanus serum and put to bed in the hospital. He had a rather stormy convalescence on account of considerable infection and some osteomyelitis with losses of pieces of bone. He left the hospital at the end of 70 days. When he left, he was able to walk. He came in for a long period of time for dressings. He started work May 1, 1928, having been disabled 154 days. He had an operation September 1, 1929. A large piece of bone was removed. Since then the wound has completely healed, and he is able to do any kind of work.

Case 15.—G. J., male, aged 47, married, was injured December 8, 1927, in an iron mine by a car of ore dumping over on him. He was brought to the hospital in a state of shock. He was a large muscular man and an old miner. Examination showed injury to the pelvis and a ruptured bladder was feared. He also had a traumatic asphyxia. His face was very much swollen and purplish in color. This extended down to the neck and upper part of the chest, especially to the front. He had some small hemorrhages under the skin and in the conjunctiva of the eyes. The pulse was fair. His greatest complaint was of pain in the pubic region. *X*-ray of the pelvis and lower dorsal and complete lumbar region showed nothing in the spine but a separation of the symphysis pubis and of the right sacroiliac joint. The urine was a little smoky, had some red blood cells, a large amount of albumin, and gave a reaction for blood by the guaiac test. The bladder was filled with sterile boric acid solution and the full amount of fluid was returned. It was therefore felt that he did not have a ruptured bladder. The following day, the urine was clearing, was not so smoky and did not contain so much albumin. The urine gradually cleared up; no gross blood was seen at any time. The pubic bone was displaced upward on the right side. He was treated by extension traction and a wide belt placed around the trochanters with buckles tightened up gradually. He remained in the hospital until April 14, 1928, making a total of 128 days. At that time he was able to walk around with crutches. He began light work February 18, 1929, and has since continued to work.

Case 16.—J. N., male, aged 46, single, was injured by being struck by an automobile November 23, 1928. He was brought to the hospital. *X*-ray taken at once showed the following fractures of the pelvis: (1) fracture in two places of the right horizontal ramus of the pubis; (2) fracture of the descending ramus of the pubis; (3) fracture of the left pubic bone through the body; (4) fracture of the sacrum at its lower right side near the sacro-iliac joint. Position of the fragments was good except that there was a jamming down and impaction of the right horizontal ramus, which had been fractured in two places. This jamming down was at the pubic end. This patient was in good condition. There was no blood in the urine. There was considerable extravasation of blood in the tissues. Patient was placed flat in bed on his back and supported by sandbags. On January 5, 1929, he was able to walk and was allowed to go to the home of a friend, staying in the hospital 43 days. He returned to light work in about seven months or 210 days. At present he is working daily in an iron mine. He says that his pelvis does not feel quite secure and firm. There is considerable displacement of the fragment of the right horizontal ramus with some palpable deformity. This fragment possibly should have been operated on for better replacement.

Case 17.—S. W., male, aged 48, married, was injured March 9, 1929, by a cow jumping on him and knocking him down. He was brought to the hospital in good condition. *X*-ray showed fracture of left acetabulum with displacement upward of the head of the femur and about 0.5 inch shortening. He was put to bed in the hospital with traction, suspension and abduction. He later developed a foot drop, which, however, entirely cleared up. It was doubtless due to peroneal nerve injury. He remained in the hospital until May 4, 1929, a total of 56 days, when he was taken to his home and put to bed and extension reapplied. May 21st all extension was removed. The patient was in bed for a week, until May 29, 1929, when a walking caliper was applied. On July 9th the caliper was taken off; movements were excellent in all directions and there was about 0.5 inch shortening. At present time he is doing well, still limps some and walks with a cane.

Case 18.—M. R., male, aged 22, single, was accidentally shot July 30, 1929, and was brought to the hospital. It was found that a bullet had struck him on the right side about the region of the brim of the right ilium pretty well back, the bullet coming out on the opposite side. He lost considerable blood and was in poor condition. *X*-ray of the pelvis and lower spine region taken antero-posteriorly showed fracturing of the right ilium and lead scattered along the course of the bullet with injury to the spinous processes and laminæ of the fourth and fifth lumbar vertebræ. A lateral *x*-ray picture showed the same fractures. There was evidently some cord injury, as he was unable to empty the bladder and he had loss of power in his legs, although he was able to draw them up and move them quite well. The abdominal and cremasteric reflexes were present and sensation was present in both legs and feet. There was no reflex of the toes and he could move them only slightly. He remained in the hospital until August 10, 1929, when he was allowed to go to his sister's home. During the time he was in the hospital, he improved gradually. He was able in a few days to void and began to walk around on crutches after he went home. There was considerable infection of the wound and pieces of dead bone were removed at times. When last heard from he was walking with a cane and there was some discharge from the wound. He was seen June 14, 1930, when he could walk well using a cane but not without it. No knee jerk could be obtained. The wound was completely healed. He thinks he will be able to work after a while.

Case 19.—J. S., male, aged 47, married, was injured April 8, 1930, by falling into a car and being struck by some ore. The patient was in a state of severe shock. *X*-ray showed: (1) fracture of the horizontal ramus of the left pubis at its outer end and also at its inner end; (2) fracture of the body of the left pubic bone; (3) fracture of the descending ramus of the left pubic bone; (4) fracture of the horizontal ramus of the right pubic bone at the outer end; (5) fracture of the descending ramus, right pubis; (6) some separation of the left sacro-iliac joint; (7) fracture of the transverse processes of the lumbar spine. The patient was in such a severe state of shock that he soon died, living only a little over three hours. No postmortem was done and it was not known what internal injuries he may have had, such as ruptured bladder, bowel or blood vessels.

THE MANAGEMENT OF OPIUM ADDICTION

Many of the so-called specific cures have been given fair trial by critically minded observers, but the results have been consistently unconvincing. This applies to rationally conceived proposals as well as to exploited products like "Narcosan" or the alleged secret Kahle treatment discussed in the German medical press. The conclusion of a British reviewer seems to be justified that it is now realized more thoroughly than ever before that the major problem is not to free the addict from his drug but to keep him free. Morphine addiction is not characterized by physical deterioration or impairment of physical fitness. Herein lies the hope that rehabilitation by any process may be satisfactory so far as the physiologic functions are concerned. The mental and psychologic problems are not yet so easily disposed of. Relapse is common to all methods of treatment and the question as to whether the withdrawal of the alkaloid should be gradual rather than abrupt may be discussed in the light of many reports. British opinion, with a few notable exceptions, seems to be in favor of a reduction treatment as the routine method of cure. (Jour. A. M. A., September 13, 1930, p. 801.)

INTOXICATING EFFECT OF ACETYLSALICYLIC ACID AND COCA-COLA

A physician reports that young people in his community are using from 15 to 20 grains of acetylsalicylic acid (aspirin) dissolved in the soft drink, Coca-Cola, as an intoxicating beverage. The effects are due chiefly to central depression caused by the acetylsalicylic acid fortified possibly by a direct central stimulant action of caffeine and other constituents present in Coca-Cola. The actions of acetylsalicylic acid are similar to those of small doses of alcohol, or of a weak alcoholic beverage or of the barbitals or bromides. When acetylsalicylic acid is taken with a beverage like Coca-Cola, advertised for its exhilarating effects, which may be caused by a direct central stimulation by caffeine or other constituents of the latter, it is easy to see how the effects of one can be fortified by the other. The continued use of such a medicated beverage may result in undesirable effects of the same general nature as those of narcotic habituation. Here is a most insidious evil, the reinforcement of a popular and highly advertised beverage by a well advertised drug, both long suspected of dangerous tendencies. (Jour. A. M. A., November 1, 1930, p. 1366.)

SEROTHERAPY OF MEASLES AND POLIOMYELITIS

Chester A. Stewart, M.D., Ph.D., and Erling S. Platou, M.D.
Assistant Professors of Pediatrics, University of Minnesota
Minneapolis

THE annual death rate from measles is undoubtedly sufficiently high to warrant active efforts to accomplish its reduction. According to a report from London, measles during the past thirty years has become a more serious menace to life than scarlet fever, the former disease being responsible for a mortality rate of 251 per million as compared with 42 per million from the latter. In childhood, measles is responsible for about six per cent of deaths under three years of age, and for about 2.4 per cent of deaths during the first ten years of life. The mortality rate from measles may become exceedingly high following its appearance in communities which have been free from the disease for a number of years. This was illustrated by the epidemics which have occurred in certain Islands where the death rate has exceeded 25 per cent of the population. The serious potentialities of measles epidemic illustrate that such outbreaks cannot be viewed with complacency and emphasize the need of developing effective prophylactic and therapeutic measures.

For a number of years the contagium of measles has been known to be present in the blood, and also in the buccal and nasal secretions, particularly during the pre-eruptive and early stages of the disease. Attempts to isolate and identify the causative organism have not produced conclusive results, although these investigations have been conducted over a period of more than sixty years by many careful workers. During recent years the attention of investigators has been directed particularly toward the identification of either a filterable virus or a micrococcus as the possible cause of measles. Those who favor the micrococcus concept as the causative factor of measles (Ostrovsky ('97), Tunnicliff ('17), Caronia ('23), Cory and Day ('27) and others) however, apparently are individually considering somewhat dissimilar organisms falling in the group, and among themselves are unable to agree upon any one of these different strains of cocci as the sole and true etiology of measles. The demonstration that certain micrococci can be isolated from the blood of patients having this disease no doubt is of importance, but does not necessarily constitute proof that they are the etiologic agent.

Opposed to those who favor the micrococcus theory, there are a considerable number of investigators who consider a filterable virus to be the cause of measles. Those supporting this opinion include Hektoen ('05), Blake and Trask ('21), Degkwitz ('27) and others. To date, however, this filterable virus has not been isolated in pure culture.

At present one must feel that the etiology of measles is still disputed, and conclude further that the use of the various anti-measles sera for therapeutic, prophylactic and attenuating purposes other than convalescent or adult immune human serum probably should not be recommended for general use until more conclusive evidence is presented that the causative agent of measles has been definitely isolated, and that the various artificial sera are producing more constant results than have been reported in the literature.

THERAPEUTIC USE OF SERUM

The therapeutic administration of anti-measles serum is desirable in certain instances, particularly when the disease develops in a malignant form, and also when it arises as a complication of some previously existing acute and serious illness. Under such circumstances the administration of convalescent serum is of value in alleviating the severity of the disease and shortening its course. The first therapeutic use of convalescent serum was reported by Weisbecker in 1896. Since then Majoli ('15), Ribadeau-Dumas and Brissaud ('18), Terrien ('19), Maniel ('22), and others have employed the serum therapeutically with apparent benefit. Recently the production of animal anti-measles serum has been attempted, particularly by Tunnicliff and Hoyne ('26), but to date its therapeutic value is not sufficiently well established to justify recommending its general use. For the present, therefore, the general therapeutic use of anti-measles serum should be limited to the administration of either convalescent serum or immune adult blood in rather large amounts as early in the course of the disease as possible.

PROPHYLACTIC USE OF ANTI-MEASLES SERUM OR PASSIVE IMMUNIZATION

The effectiveness of convalescent serum in the prevention of measles was first demonstrated by Cenci ('07), and since that time by numerous investigators, including Nicolle and Conseil ('18), Degkwitz ('20), Zinger ('24), Toomey ('26), Park and Freeman ('26), Bivings ('27), Boder ('29), Van Cleve ('30), Barenberg, Lewis and Messer ('30), and others. About 5 c.c. of serum collected between the tenth and ninetieth day of convalescence is sufficient to protect a young child. The passive immunity conferred in this manner, however, lasts only a few weeks. As pointed out in the bulletin of the New York Department of Health for January 25, 1930, "there are grave objections to any method which will entirely prevent measles passively, for this would lead to the gradual building up of a large population of non-immunes which would be decimated should the disease perchance be reintroduced." In communities that have been free from measles for years, and thus made up entirely of non-immunes, the disease is apt to develop a malignant form when newly introduced. For example, Panum ('27), reported that the appearance of measles in the Faroe Islands after the absence of the disease since 1781, resulted in 6,000 cases out of a population of 7,872. Also when measles was first introduced into the Sandwich Islands in 1775, within four months 40,000 of a population of 150,000 died. Likewise the introduction of measles in the Fiji Islands in 1874 resulted in the death of 20 per cent of the population.

Prophylactic use of convalescent measles serum, therefore, probably should be limited largely to prevent epidemics in institutions, or to prevent the development of the disease in weak and debilitated children in whom the occurrence of measles superimposed upon conditions previously existing might prove fatal. When the passive immunity is desired, the administration of 5 to 10 c.c. of serum collected in the first three months, and preferably in the first two or three weeks of convalescence is recommended. The serum should be given during the first four days after exposure, and repeated in twelve days (Barenberg, Lewis and Messer ('30)), if subsequent exposure seems probable. Aside from these special instances anti-measles serum probably should not be employed prophylactically, for the immunity conferred in this manner lasts only a short time and merely defers the date when the child will have the disease. When convalescent serum is not available, adult immune serum may be administered in larger amounts (60 c.c.).

THE ATTENUATION OF MEASLES BY IMMUNE SERUM

The greatest service physicians can render in the control of measles probably lies in the employment of measures which attenuate the disease rather than those that prevent it. In this manner a lasting immunity is developed by the patient from a mild attack of measles. This may be accomplished in a very practical and simple manner, through the administration of adult immune whole blood to the exposed children.. According to the recommendation of the New York Board of Health, the blood should be obtained from the parent who has had measles and given intramuscularly, a procedure which does not require blood grouping. The dosage recommended for children under five years of age is 30 c.c., and double that amount for older patients. This permits the patient to develop a lasting immunity to the disease from a mild or attenuated complication-free attack of measles.

POLIOMYELITIS

Acute anterior poliomyelitis at first is an acute generalized systemic infection tending in the course of a few days to invade the central nervous system, following which the dreaded paralysis frequently occurs. In general there are three types of the disease, namely: the abortive, the non-paralytic and the paralytic type. In the abortive type it is assumed that the disease stops at some point in its development, failing for some unknown reason to proceed to localization in the central nervous system. Some feel that such abortive cases of poliomyelitis are very prevalent, and that consequently the majority of adult individuals have obtained an active immunity to the disease from mild attacks of this character. Since the diagnosis of the abortive type of the disease is based solely on symptoms, its prevalence remains largely a matter of conjecture. In cases where an invasion of the central nervous system occurs as demonstrated by physical signs and lumbar puncture, subsequent paralysis may or may not appear. This permits one, therefore, to recognize the clinically well established paralytic and non-paralytic forms of the disease, which unfortunately are indistinguishable at the outset. The physician, consequently, is compelled to administer serum for all cases of poliomyelitis recognized in the pre-paralytic stage. Since the serum must be given early in the disease if paralysis is to be prevented, the diagnosis of poliomyelitis in its pre-paralytic stage is of great importance.

At the onset the patient develops a fever, headache, and variable gasto-intestinal symptoms, including vomiting and diarrhea or constipation. The prostration seems to be greater than the temperature, which is usually under 102 F, would warrant. Although the general symptoms are fairly constant, they are not sufficiently characteristic to permit a recognition of the disease. A diagnosis of pre-paralytic poliomyelitis, therefore, must be made on the basis of the physical signs, which fortunately present a fairly uniform and significant picture in the early stage. One observes that the face is flushed except for the frequent presence of a definite circumoral pallor. In addition the throat is mildly reddened, and the pulse is usually accelerated out of proportion to the elevation in temperature. The remaining physical findings are limited practically to those which have to do with the nervous system. The patient may present varying degrees of hyperesthesia and slight clouding of the consciousness together with manifesting rather coarse tremors in certain instances. Of particular importance is the presence of a rigidity of the spine, which differs somewhat from the rigidity noted in meningitis. In infantile paralysis the head usually is not retracted, and although the neck is slightly rigid the rigidity seems to involve particularly the lower cervical, thoracic and lumbar rather than the upper cervical region. Thus in poliomyelitis the patient can usually flex the head on the neck at the atlanto-occipital joint, but is unable to bend the neck forward. As a result the head can be brought about half-way forward before resistance and pain are encountered. A general rigidity of the spine is a more constant and characteristic feature than stiffness of the neck. The spinal rigidity is so pronounced that in a sitting position the patient is unable to bend the head and trunk downward toward the knees. If the child bends forward at all, the flexion occurs almost entirely at the hips, while the spine remains straight and rigid. The deep reflexes are usually hyperactive in the pre-paralytic stage of the disease, and Kernig's sign as a rule is negative. The above signs require the performance of a spinal puncture in order to complete the diagnosis. The fluid obtained is usually under an increased pressure, and presents a very slight opalescence. The cell count usually ranges between 30 and 300, with the polymorphonuclear leukocytes predominating in the early stage of the disease. The polymorphonuclears, however, rapidly undergo a cytolysis, so that in a few days the cells are largely lymphocytes. In addition the globulin content of the spinal fluid is increased.

On the basis of the symptoms and physical findings as outlined above a diagnosis of pre-paralytic poliomyelitis probably is justified, particularly when care has been taken to exclude such conditions as meningismus, tuberculosis, lues, and lethargic encephalitis, conditions which might simulate infantile paralysis.

TREATMENT

The serum therapy of poliomyelitis has been limited largely to the administration of immune human serum. Rosenow ('30) has developed an anti-streptococcic serum for this purpose, and reports favorable results from its use. The outcome of pre-paralytic cases of poliomyelitis with respect to mortality and paralysis is so variable as to render it difficult to properly evaluate the efficacy of therapeutic measures instituted in such cases. This normal variability of the course of the disease in different individuals, therefore, has made many investigators skeptical of the alleged value of Rosenow's preparation. With regard to immune human serum there is apparently more unanimity of opinion as to its therapeutic effectiveness. Animal experiments have shown that convalescent serum neutralizes the virus of poliomyelitis and renders it innocuous, and also that the intrameningeal injection of the serum as late as twenty-four hours after the intracerebral injection of the virus prevents the development of paralytic disease. In addition beneficial results following the administration of immune human serum in the early stages of the disease occurring in man has been reported by a considerable number of investigators. For the present, then, the use of convalescent human serum is recommended for therapeutic purposes. The serum preferably should be administered as early in the disease as possible, giving 20 to 30 c.c. intraspinally and 50 c.c. intravenously or intramuscularly. If necessary the entire dosage may be given intravenously, although it is probably more advisable for a certain amount of the serum to be given intraspinally. Favorable results have been reported by Shaw and Thelander ('28) even from the intramuscular administration of the serum. Although the best results are obtained where the serum is given in the preparalytic stage of the disease, one should not hesitate to administer it after paralysis occurs, attempting thereby either to prevent a further extension of the paralysis or to promote as complete a recovery as is possible to obtain.

In the presence of severe outbreaks of epidemic poliomyelitis, convalescent human serum may be used to afford passive protection to children exposed to the disease. Although the optimum amount of serum to be used for prophylactic purposes has not been definitely established, Flexner and Stewart[28] suggest a subcutaneous dosage of 10 c.c. for young children and 20 c.c. for older children and adults. A repetition of the injection at the end of four to six weeks is suggested, should the epidemic outbreak become severe and endure for several weeks.

The main objection to the use of convalescent human serum for therapeutic and prophylactic purposes is the difficulty of obtaining it. Partly for this reason it probably will be used more generally at times when there are a considerable number of cases of the disease appearing in a community, rather than when the outbreaks are limited to sporadic instances.

At present there is little to be said concerning active immunization in poliomyelitis, aside from calling attention to the fact that monkeys have been rendered immune to the disease through intradermal injection of the virus.

SUMMARY

1. Convalescent serum or immune adult blood when used in rather large amounts may be administered beneficially for therapeutic purposes in instances where measles develops in a malignant form, and also when it arises superimposed on some previously existing acute and serious illness.

2. For prophylactic purposes the use of convalescent measles serum probably should be limited largely to prevent epidemics in institutions, and also to prevent the development of the disease in weak and debilitated children. Five to ten c.c. of convalescent serum should be given within the first four days after exposure. When convalescent serum is not available, adult immune serum may be used, but should be given in rather large amounts.

3. The greatest service physicians can render in the control of measles involves an attenuation of the disease, thereby permitting the patient to develop a permanent immunity to measles from a mild complication-free attack. This may be accomplished by using immune adult blood, giving 30 c.c. intramuscularly to children under five years, and double that amount to older patients.

4. When dealing with poliomyelitis the therapeutic administration of convalescent human serum, preferably in the pre-paralytic stage of the disease, is recommended. For this purpose give 20 to 30 c.c. intraspinally together with 50 to 75 c.c. intravenously. Furthermore, one should not hesitate to administer the serum after paralysis occurs, attempting, thereby, either to prevent a further extension of the paralysis or to promote as complete a recovery as possible.

5. In the presence of severe epidemics convalescent serum may be used to afford passive protection to exposed children, giving 10 c.c. subcutaneously to young children, and double that amount to older patients. A repetition of the injection at the end of four to six weeks is suggested should the epidemic outbreak continue in severity for several weeks.

LITERATURE

1. Aycock, W. L., and Luther, E. H.: Jour. Am. Med. Assn., 91:387, 1928.
2. Aycock, W. L., Luther, E. H., and Kramer, S. D.: Jour. Am. Med. Assn., 92:385, 1929.
3. Aycock, W. L., Luther, E. H., McKhann, C. F., Smith, E. C., and Kramer, S. D.: Jour. Infect. Dis., 45:175, 1929.
4. Bader, G. B.: Jour. Am. Med. Assn., 93:668, 1929.
5. Barenberg, L. H., Lewis, J. M., and Messer, W. H.: Jour. Am. Med. Assn., 95:4, 1930.
6. Bivings, L.: South. Med. Jour., 20:735, 1927.
7. Blake, F. G., and Trask, J. D.: Jour. Exp. Med., 33:385, 1921.

8. Caronia, G.: Pediatria, 31:801, 1923, 32:888, 1923.
9. Cary, W. E., and Day, L. A.: Jour. Am. Med. Assn., 89:1206, 1927.
10. Cenci, F.: Riv. di. clin. pediat., 5:10, 1907.
11. Degkwitz, R.: Ztscher. f. Kinderh., 25:134, 1920.
12. Degkwitz, R.: Jour. Infect. Dis., 41:304, 1927.
13. Flexner, S.: Internat. Clin., 1:59, 1929.
14. Flexner, S., and Stewart, F. W.: Jour. Am. Med. Assn., 91:383, 1928.
15. Hektoen, L.: Jour. Infect. Dis., 2:238, 1905.
16. Kato, K.: Am. Jour. Dis. Child., 36:526, 1928.
17. Kellogg, W. H.: Jour. Am. Med. Assn., 93:1923, 1929.
18. McKenzie, M.: Can. Med. Assn. Jour., 21:291, 1929.
19. Majoli, U.: Poli-Clinio., 22:1229, 1915.
20. Maniel, M.: Soc. de Med. francaise, seance der 20 Juillet, 1922.
21. Nicolle, C., and Conseil, E.: Bull. et mem. Soc. Med. d. hop. de Paris, 42:336, 1918.
22. Ostrovsky, E.: Congr. Internat. de med., 2:174, 1897.
23. Park, W., and Freeman, R. G.: Jour. Am. Med. Assn., 87:556, 1926.
24. Ribadeau-Dumas, L., and Brissand, E.: Bull. et mem. Soc. Med. de hop. de Paris, 42:110, 1918.
25. Rosenow, E. C.: Jour. Am. Med. Assn., 94:777, 1930.
26. Shaw, E. B., and Thelander, H. E.: Jour. Am. Med. Assn., 90:1923, 1928.
27. Terrien, E.: Bull. et mem Soc. Med. de hop. de Paris, 63:1134, 1919.
28. Toomey, J. A.: Am. Jour. Dis. Child., 32:402, 1926.
29. Tunnicliff, R.: Jour. Am. Med. Assn., 68:1928, 1917.
30. Tunnicliff, R., and Hayne, A. L.: Jour. Infect. Dis., 38:48, 1926.
31. Van Cleve, J. D.: Arch. Pediat., 47:124, 30.
32. Weisbecker: Ztschr. f. klin. Med., 30:312, 1896.
33. Zingher, A.: Jour. Am. Med. Assn., 83:1186, 1924.

SODIUM 2-OXO-5-IODO-PYRIDINE-N-ACETATE (INTRODUCED AS UROSELECTAN)

The Council on Pharmacy and Chemistry publishes a preliminary report on sodium 2-oxo-5-iodo-pyridine-N-acetate (also designated as sodium-5-iodo-2-pyridon-N-acetate), a new substance for use in the radiographic visualization of the urinary tract which was introduced under the name Uroselectan. The Council reports that the product is a definite chemical substance which promises to be an advance in the radiographic visualization of the urinary tract, though its indications, advantages and limitations are at the present time not fully established. The Council considers the product suitable for experimental use by those who are versed in the technic of urologic examinations. It publishes a concise and carefully considered statement of the introduction of the drug and the evidence for its use, prepared for the Council by Drs. Braasch and Bumpus. (Jour. A. M. A., November 8, 1930, p. 1425.)

THE ETIOLOGY OF GINGER PARALYSIS

Within the past year a peculiar form of paralysis has afflicted many persons, particularly throughout the Midwestern or Southwestern states. Evidence has accumulated that the malady is closely associated with the drinking of fluidextract of ginger. The latter has been sold extensively since the introduction of the Volstead Act, for beverage purposes, because of a ruling of the Prohibition Bureau to the effect that the official fluidextract of ginger is a non-potable beverage, thus removing the restriction from its sale. It was concluded from the evidence that an adulterated and poisoned product was being circulated last winter. An investigation was undertaken by the United States Public Health Service and this has shown that the paralysis was caused by tricresyl phosphate present in some fluidextracts of ginger as an adulterant. (Jour. A. M. A., November 29, 1930, p. 1672.)

IMMUNOLOGY OF DIPHTHERIA AND SCARLET FEVER*

W. Ray Shannon, M.D.
Saint Paul

With the steady advance in the specific knowledge of disease, readaptations and readjustments of thought and action must keep pace. It is our purpose here to present an appraisal of present day opinion and practice in the specific control of diphtheria and scarlet fever.

Little need be said about the use of specific serum or antitoxin for the cure of diphtheria. It is sufficient to say that it must be used early and in adequate dosage to neutralize all of the toxin of the infection if its maximum value is to be realized. Schick recommends from 100 units per kilogram in the mild cases to 500 units in the most severe cases. It should be given all in one dose and not in small repeated doses except in cases to be mentioned later where desensitization must be carried out. Naturally rapidity of action depends upon the promptness with which the antitoxin gets into the blood stream. Therefore in the most critical cases it should be introduced intravenously. In those slightly less serious or in whom intravenous injection is impossible, intraperitoneal injection affords a more rapid means of introduction than the third way, namely, the intramuscular route. The serum should never be introduced subcutaneously, except for purposes of desensitization, because of the slow absorption by this route.

It has been common practice to use antitoxin for prophylactic so-called passive immunization in cases of actual or suspected exposure. While occasionally justifiable, modern medical practice demands that we consider the possible costs of such action. The immunity so induced lasts no more than two or three weeks, frequently subjects the patient to a discomforting serum reaction and leaves him sensitized to horse serum, thus increasing the hazards in case a future necessity might arise for the use of an antitoxin. In the great majority of cases it would be better practice to postpone the use of immune serum until careful supervision shows suspicious symptoms of the disease or until positive nose or throat cultures have been obtained. Final decision of policy in this regard must, of course, rest with the individual circumstances of each case.

Present advance in the control of diphtheria is being made mainly along the lines of active immunization by means of vaccination. The success of this procedure is made possible by the development of an easily applied test of susceptibility to the disease. This test, named the Schick test after the man who developed it, consists of the intracutaneous injection of a measured amount of diphtheria toxin (1/50 M.L.D.) contained in a suitable medium. While extreme emphasis is placed upon an exact technic in its performance by most writers, as an actual matter of fact the test has a sufficiently wide margin of safety, as demonstrated by Dudley, to be extremely valuable even in the hands of a novice. The points usually emphasized are these: that exactly the correct amount of toxin must be introduced, that it must be injected intradermally and not too deeply, and that the toxin must be of proper potency. While all of these points are important, Dudley has shown that a variation of 25% either way in the amount of toxin injected would not weaken the value of the test too greatly and that even subcutaneous injection will usually afford accurate information, though perhaps a little more difficult of interpretation. The one important requirement is that the toxin shall be of proper potency. In this respect the clinician is largely at the mercy of the manufacturer and must accept his claims, but at least the physician can use meticulous care in carrying out instructions given in the package. This is especially important as regards the promptness with which the toxin is used after dilution. It must be used within twenty-four hours and preferably within a very few hours after dilution.

Unless an individual has substances in his blood to counteract the toxin injected he will develop a characteristic inflammatory reaction at the site of the injection. This reaction is termed a positive Schick, and it will be noted unless the subject has as much as 1/30 unit of antitoxin per c.c. of serum. Approximately this amount of antitoxin in the blood is required to neutralize the amount of toxin injected and has been found by clinical experience to be sufficient to protect the individual against any ordinary contact with the disease. Hence a negative Schick reactor has this much or more antitoxin in the blood and is essentially immune.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 14, 1930.

The interpretation of the Schick test offers little difficulty in the majority of cases. Dudley describes a typical positive reaction as follows: " . . . in about 24 hours, or earlier, . . . a red, almost scarlet, patch about an inch in diameter appears, which is generally elliptical rather than circular, the major axis of the ellipse being in line with the limb. In four or five days the reaction, after first becoming more intense, begins to fade and desquamate, and become covered with bran-like flakes of cracked superficial epithelium, which gives to the reaction a most characteristic appearance at the end of a week. The reaction disappears slowly, and remains evident for a month or more as a pigmented patch of variable tint. A certain amount of induration accompanies the color reaction during the active stage. Variations either way from this usual reaction may occur, on the side of more intensity up to the point where vesiculation and superficial ulceration may be present, and on the side of lesser intensity to the point where nothing in the way of pigmentation or desquamation may be observed. The former indicates increased susceptibility and the latter a partial immunity to diphtheria."

Some confusion in the reading of the tests may be met with on account of a pseudo-Schick reaction. While this reaction has certain qualities which usually identify it to the experienced, the casual observer must rely upon the duration of the inflammation for its recognition. According to Dickenson only 4.5 per cent of pseudo-Schick reactions are visible at the end of a week. Park says that pseudo-reactions constitute about 15 per cent of the reactions in this country. Thus in not more than two-thirds of one per cent of the reacting cases would the pseudo-Schick be even visible at the end of a week. If we read our tests after seven days then, in only a very small number of cases should there be any confusion and these will usually be cases in which both a pseudo and positive Schick have occurred, the so-called combined reaction.

The discovery of the Schick test has opened the way for extensive minute study of diphtheria. As a result it has been found that almost all infants are immune to diphtheria at birth and that rather rapidly during the latter part of the first year this immunity is lost. Breast feeding retards this loss of immunity. After one year of age the incidence of immunity as shown by the number of negative Schick reactions begins gradually to increase. The congenital immunity is thought to have been passively transferred to the infant before birth through the placenta and for some time later through the breast milk. The later rise is thought to be actively acquired as a result of repeated subclinical infections. Hence the number of persons exhibiting this natural immunity increases with age and directly in proportion to the existence of those factors which favor exposure such as crowded living, etc. Thus it is that those persons living in rural communities are less apt to have acquired an immunity by the time they have reached adult life.

The natural sequel of such observation was the attempted artificial production of an active immunity by means of vaccination. This has proven so successful that it is now one of the most important public health measures. It has become a moral responsibility to the medical profession so well recognized that if physicians do not accept it this important health measure will, rightly, be taken out of their hands altogether.

The preparation most widely used in this country for this purpose is a solution of diphtheria toxin partially neutralized by the addition of antitoxin. It is necessary to neutralize a part of the toxin in order that a sufficient amount may be injected to bring about an immunity reaction. Naked toxin is too toxic to be used unbuffered.

Three inoculations of 1 c.c. each are given at weekly intervals. Following these injections a gradually developing immunity appears, due to the presence of antitoxin in the blood, which by the time six months have passed will have increased sufficiently to render the Schick test negative in about 75 or 80 per cent of cases.

Positive reactors should at this time receive a second series of injections, following which most will have become Schick-negative. Persons still remaining Schick-positive should be given a third series of inoculations, in spite of which a small number may still remain Schick-positive, apparently unable to produce antitoxin. There is reason to believe that the duration of the immunity so induced is permanent. Park has shown that 90 per cent have shown a permanent immunity over a period of nine years. It seems probable that the incidence of permanent immunity might in some measure be influenced by the occurrence of minor exposures to the disease. In those cases which again become Schick positive it is probable that they retain some degree of immunity in that they seem to retain an ability to form antitoxin rapidly when necessary. In these cases a very small stimulus will cause a rapid disappearance of the Schick test.

The greatest drawback to the use of this product for immunizing purposes is the fact that by using it one is sensitizing the individual to horse serum and thus increasing the hazards of any future emergency necessitating the use of horse serum. Park and several other men of wide experience feel that this factor is negligible but numerous reports indicate that this is indeed a factor that must be considered. The work of Gordon and Creswell is especially convincing, and it is hardly believable that any careful practitioner would willingly advise running this risk in such a wholesale manner when the uses of horse serum in present day medicine are becoming so rapidly increased. This must be thought of as a definite objection to the use of toxin-antitoxin for immunization to diphtheria, not great enough to preclude its use so long as no equally good substitute was available but enough so to stimulate search for such a substitute.

This was a factor in the prolonged delay in the usage of toxin-antitoxin in France. It probably was largely responsible for the development by Ramon of a vaccine which he called antitoxin that was rendered non-toxic by treatment with formaldehyde and heat. This treatment destroys the poisonous quality of the diphtheria toxin but leaves its immunizing properties intact. Ramon and many others have used it extensively in France and find it not only safe for injection, but also much superior to toxin-antitoxin in immunizing value. Since it contains no horse serum it has no sensitizing qualities. Quite a number of American investigators have also used it and substantiate all of the claims of Ramon and his co-workers. Ramon's method called for the subcutaneous injection of three doses; the first 0.5 c.c., the second 1 c.c. given three weeks later and the third 1 or 1.5 c.c. after another two weeks. Dick and Dick found a two week interval between all three injections very satisfactory. Rarely under the age of eight but with increasing frequency as age advances from this point, reactions of varying intensity occur with the use of toxoid. These reactions are principally local and usually unimportant from a general standpoint. They seem to depend upon a sensitization to some of the protein substances of bacterial or other origin contained within the injected fluid. They are not reactions to the diphtheria toxin. Thus they result from individual sensitivity to the same substances that are responsible for the pseudo-Schick reaction, and the Dicks maintain that if such a reaction occurs in the preliminary Schick test it is best to begin immunization with .1 to .25 c.c. of the toxoid. Results with toxoid yield from 95 to 100 per cent immunity after three injections as compared with from 75 to 80 per cent with toxin-antitoxin. Furthermore the time necessary for the production of immunity is much less, the Schick becoming negative usually in from five to six weeks.

In an effort to eliminate the sensitizing properties of toxin-antitoxin, Larson found that he could render diphtheria toxin innocuous without destroying its immunizing quality by mixing it with a solution of castor oil soap (sodium ricinoleate). He has had marked success in immunizing against diphtheria with this product. At the Gillette State Hospital for Crippled Children, where it has been used combined in the same solution with scarlet toxin for the past four years with an average daily population of 230 children, there have been six clinical cases of diphtheria with an additional 39 positive culture cases without clinical symptoms.

Twenty-five out of twenty-seven of these 39 that were so tested had virulent organisms in the cultures. Compared with the three year period preceding, when 252 positive culture cases occurred, most of them representing clinical diphtheria, this is most strikingly successful control.

It becomes evident when one considers the question that the development of the Schick test was the basic principle upon which all the recent advance in the understanding and control of diphtheria was based. The knowledge so attained was theoretically transferable to any contagious disease whose causative agent was known and in which the symptoms were produced through the agency of a soluble toxin. Thus it was that when the Dicks had demonstrated the organism of scarlet fever to be a form of hemolytic streptococcus liberating a soluble toxin which was responsible for the immediate symptoms of the disease, the path to rapid progress was clearly defined. The skin test for susceptibility, congenital immunity followed by increasing susceptibility with subsequent gradually acquired natural immunity as age advances, vaccination for the production of artificial immunity and finally antitoxin for the control of the disease were all suggested at the start.

In the use of the skin test considerable difficulty has been experienced by many observers. The Dicks defend the test very vigorously and say that while it is very exacting it affords results that are very reliable when all details as to procedure are carefully carried out. They claim 100 per cent reliability for a total of more than 35,000 persons. The method is similar to that used in the Schick test. One-tenth c.c. of a solution of toxin of such a titre that this amount represents the rather arbitrary unit of one skin test dose is injected into the skin of the forearm. In controlling artificial immunity the Dicks make another injection of twice this amount on the other arm. The test must be read under a strong light after from 18 to 24 hours. Any redness as large as 10 mm. in any diameter is regarded as positive. No induration is required and tests read after 24 hours are not reliable.

Using this test the Dicks have traced a curve of natural immunity essentially similar to that already described for diphtheria. As in this disease, the percentage of immunity in a given group is proportional to the opportunity for repeated subclinical exposure.

As to the artificial production of active immunity by vaccination the problem is somewhat different than in diphtheria. The streptococcus of scarlet fever produces its deleterious effects not only through the agency of a soluble toxin but also through actual invasion of the tissues, and many of the worst elements of the disease are a result of the latter quality. Present methods of study are not effective in measuring the antibacterial elements of immunity but are confined to the antitoxic factors. With even this handicap, however, the Dicks claim a tremendous success in artificial immunity, again 100 per cent efficiency. They inject subcutaneously graduated amounts of naked toxin at weekly intervals, increasing from 500 skin test doses in the first injection up to from 80,000 to 100,000 skin test doses in the fifth or last inoculation. If the Dick test two weeks later is still positive the fifth dose is repeated.

Others have found the reactions caused by the Dick technic too severe for general usage. The originators themselves admit that about 10 per cent of the injections are accompanied by general reactions, though how severe these are is omitted from the summary I am quoting. They do, however, state that no permanent harm has resulted from active immunization of 12,775 susceptible individuals.

The effort is constantly being made to find a method of immunization that is more practical than one requiring five injections and less severe in its immediate effects. Peters and Allison have used a method by which they spray the toxin into the nose, and have obtained rather a remarkable degree of success. No reaction whatever occurs during the immunizing process. Several workers have used scarlet toxoid successfully. Here also disagreeable reactions are lacking. The application of the toxin in ointment form to the skin represents another effort at simplifying the process of immunization.

In 1926 Larson began immunizing against scarlet fever with a toxin buffered, or rendered relatively non-toxic, by the addition of sodium ricinoleate. Certain advantages were noted in a toxin so protected over the naked toxin as used by the Dicks. Larger doses could be employed without bringing about disagreeable reactions and the degree of immunity produced seemed to be definitely greater than that produced with a like amount of toxin unbuffered. Later this toxin was mixed with a suspension of the organisms of scarlet fever, thus using not only a toxin but also the organism for immunity production. The Dicks have viciously attacked this method of immunization as totally incompetent and misrepresented, giving a wholly false sense of security because of its total failure to accomplish its ends.

Since November 1, 1926, the Board of Health of the City of Minneapolis has been using this vaccine, combined with diphtheria toxin in the same dose. From that date until August 31, 1929, a total of 24,212 injections had been made. A complete course of treatment, three doses, had been given to 6,953 children and incomplete courses, one or two doses, to 2,205 more, making a total of 9,158 children immunized or partially so. It was estimated that 4,000 more were treated by this method by private physicians. The total number of children in Minneapolis between the ages of one and sixteen was estimated at 105,000. During the observation period 3,973 cases of scarlet fever were reported. Of this number only 55 were in children who had received the ricinoleated vaccine. Scarlet fever was thus ten times as common among those children who had not received Larson's vaccine as among those who had. Parks claims for toxin-antitoxin only a reduction to one-fifth the incidence in those who have not received such vaccination against diphtheria. From this experiment it would seem that practically the ricinoleated scarlet fever toxin is very efficient in controlling scarlet fever.

Again, at the Gillette State Hospital for Crippled Children, where this vaccine has also been used in combination with the diphtheria toxin, from May, 1926, to July, 1930, only eleven cases of scarlet fever occurred. Of these eleven, five occurred within a week after admission to the hospital. Thus only six cases of scarlet fever developed in patients that had been in the hospital long enough to be immunized. During this time twelve adult attendants who had not been immunized developed the disease. Any of the attendants or of the eleven patients would have been capable of starting an epidemic if the number of susceptibles had not been very low. During this period 75 per cent of the population came from rural communities.

The duration of artificially produced immunity is a question that can not as yet be settled. The Dicks claim that retests made at the end of one, two and three years indicate that 90 per cent of patients who are immunized to the point of entirely negative skin reactions, retain their immunity. Between 5 and 9 per cent require second immunization. It seems fair speculation that the duration of such immunity might in some measure at least be influenced by the occurrence of slight subclinical infections and that thus the conditions of living, such as crowding, etc., might play the same role here as they do in the development of natural immunity.

The same factors that complicate the problem of artificial immunization render the problem of antitoxin more difficult. For maximum efficiency a serum that is both antitoxic and antibacterial should be produced. This has led to two principal methods in the production of scarlet fever serum. The first is made by injecting the horse with toxin alone, thus stimulating the production of a pure antitoxin. In the second method an attempt is made to produce an antibacterial serum as well by inoculating live organisms into an agar plant that has been placed within the body of the animal. Thus not only is the horse forced to produce an antitoxin but also reactionary bodies against the bacteria themselves. No marked superiority has as yet been demonstrated for either method, though at present most commercial serums are produced in the latter manner.

There is little doubt but that scarlet fever antitoxin is effective in controlling the immediate symptoms of the disease. Here, as in diphtheria, it should be given early for maximum effect. There is much more generally expressed doubt as to the value of the serum in preventing complications. The latter, it will be noted, are usually a result of bacterial invasion and not of purely toxic origin. On the other hand certain enthusiastic supporters of the serum treatment insist that the complications are very materially reduced by the use of serum. Still other writers hold that the serum does not affect the incidence of complications in mildly toxic cases, but that it does in the severe types. Thus two general opinions are to be found among writers on the subject: one that the serum should be used as soon as scarlet fever can be diagnosed, regardless of severity, or even as soon as scarlet fever is suspected (Dick); and the other that would limit its use to those cases that show marked toxemia at the start. The latter opinion is certainly the more conservative and it seems to me that conservatism has virtue in this time of wholesale serum injection. Mild scarlet fever is not a severe disease. Even moderate grades of serum disease are much more discomforting, and serum reactions are particularly common following the administration of scarlet fever serum. It is true that serious complications may supervene even following the mildest cases of scarlet fever, but until it is thoroughly proven that the serum is of considerable benefit in preventing such accidents in the mild cases, we are not justified in subjecting the patient to the hazards and discomforts that so frequently follow its use. There can, however, be no doubt that it should be used in the moderately severe and severe cases. The use of scarlet fever serum for prophylaxis in case of exposure is mentioned only to be condemned. It should never be used then. Before the discovery of antitoxin, convalescent serum was used in the treatment of scarlet fever with some degree of success. The obvious difficulties encountered in procuring it when needed greatly limited its use in general practice.

When scarlet fever antitoxin first appeared, it was thought that it would be useful as a means of demonstrating the skin blanching phenomenon (Schultz-Charlton test) and thus aid in clearing the diagnosis in certain doubtful skin eruptions. Toomey and his co-workers have shown that most of the serums are useless for this purpose, some even giving rise to an increased redness at the site of injection. These authors aptly suggest that if the blanching test is dependent upon the antitoxin content of convalescent serum, then most of the commercial serums are devoid of antitoxin.

It is usually a safe maxim that nothing is acquired without a price being paid for it. This is true of the progress that is being made against the two diseases under discussion. New problems arise, by-products of the new methods employed, which while less of a menace than the original difficulty must nevertheless be dealt with. Two problems which pertain especially here are that of the carrier and that of sensitization to horse serum. The first of these has been recognized as a formidable obstacle in the control of diphtheria for many years. It bids fair to become a much greater problem as the number of immunes increases. This is especially true in institutions where it is possible for a large number of inmates to become carriers after immunization in such an insidious manner as to produce no symptoms whatsoever. Only the closest imaginable control, combined with frequent cultures, will cope at all with this menace. While the carrier has long been recognized as a menace as regards scarlet fever, the lack of method for identification has limited the problem to one of surmise. The precise methods—culture, etc.—which are bound to develop from the increasing knowledge of this disease, give promise of duplicating for scarlet fever what is happening in the case of diphtheria. Much must yet be done in the control of these diseases along the line of prevention and cure of the carrier.

Even more important is the problem of sensitization to horse serum. While some of those who deal with this factor in the immunization of thousands of cases are inclined to think lightly of it, the physician who encounters the single case of sensitization is apt to regard this phase of the subject more seriously. He realizes that a single death or near death from the giving of a serum, were it traced to methods employed in the efforts to prevent disease, would do more damage to the cause of prophylaxis than a dozen deaths from the lack of it could rectify. Such is the psychology of the uninformed. With the present trend in medical practice it will not be long until a great majority of individuals will not only have become sensitized to horse serum, but will have received one or more shock doses before they have run the gamut of common diseases with their prophylactic and curative procedures. Certain observations seem to indicate that the severity of the reactions increases with the number of injections. While this phase of the subject should not be overemphasized, at the same time it is not wise to totally disregard it. A sensitized state may hinder or delay the giving of therapeutic serum in circumstances where this delay is costly, and until we understand more about the subject of protein sensitization, or anaphylaxis, and are better able to cope with it, we will be wise if we avoid any unnecessary contact with it.

Regardless of what policy we adopt, we probably shall always have with us the sensitized individual to whom it is absolutely necessary to give horse serum in some form. Such individuals may be naturally sensitive (the more dangerous type) or they may have been sensitized through a previous injection of horse serum. Therefore, before serum is given, careful inquiry should always be made as to whether or not any form of serum had ever before been given. If not, it is wise to inquire as to the occurrence of asthma, especially horse asthma, hay fever, eczema, urticaria or other manifestations of allergy in either the patient or his near relatives. Positive answers to either question obligate the physician to determine whether the patient is sensitized. Even though no such history is obtained, it would still be the more conservative procedure to test the patient for sensitization before introducing a large amount of serum.

This is especially true when the injection has to be made either intravenously, intraperitoneally or intraspinally.

Mackenzie and Hanger have covered this subject in magnificent detail and their ideas on technic are as follows: To determine sensitivity, a minute amount, not more than 0.05 c.c., of a 1 to 10 dilution of serum is injected into the skin of the forearm. They advise the injection of a like amount of human serum or normal saline at the same time as a control. If the wheal induced by the injection enlarges and becomes surrounded by a zone of erythema in from ten to twenty minutes the patient is sensitive, provided the control does not behave the same way. In extremely sensitive individuals an enormous reaction may be induced. Pseudopod-like projections at the edges of the wheal occur with the higher degrees of sensitization. They advise the dilution of the serum because in this way false reactions do not occur. One can not depend altogether upon the character of the skin reaction as an indication of the degree of sensitivity of the individual. Severe reactions are not unknown, they say, in the absence of a positive cutaneous test. Therefore, even though the test may be negative, it is wise to proceed cautiously whenever a suspicious history of sensitization is obtained.

In the sensitized person desensitization is necessary. These authors recommend the initial injection of .01 c.c. of serum suspended in saline and given subcutaneously. Every half hour this injection may be repeated, doubling the dose of serum each time unless toxic symptoms occur. In such case, the next dose should be of the same amount as the preceding in order not to proceed too rapidly. When as much as 1.0 c.c. of serum has been tolerated at one time subcutaneously the next dose may be given intravenously if this method of injection be necessary. This should be reduced to .1 c.c. in saline and may be doubled each twenty minutes thereafter until the full therapeutic dose has been injected.

In cases where intraspinous injection is to be given, one should continue with the intravenous injections until 10 c.c. are tolerated. Then, after the proper interval, a like amount may be cautiously injected into the spinal canal.

Occasionally individuals are encountered in whom it seems to be impossible to bring about sufficient desensitization. Still others may be desensitized more rapidly than this technic prescribes if no reactions occur after the early doses. Almost all individuals, however, can be desensitized to the point where serum in therapeutic dosage can be safely given.

CEREBROSPINAL MENINGITIS*

Carl O. Kohlbry, M.D.
Duluth

Cerebrospinal, epidemic, or meningococcic meningitis, a disease constantly present in all large communities and often epidemic in character, continues to present difficulties in control despite our knowledge concerning it. The purpose of this paper is to summarize recent work on this subject.

Cerebrospinal meningitis is essentially a disease of children, though it may occur at any age. In Neal's series of cases in New York City, 70 per cent occurred during the first ten years of life. A great many cases appear during the first year of life and at this age it is the most common type of meningitis.

Nearly all epidemics occur during the winter and spring months; overcrowding is a factor in spreading the disease. Apparently it is a disease to which most persons have a natural immunity; multiple cases in a family are uncommon. Leukowicz states that the meningococcus is really a very slightly pathogenic organism, but its feeble virulence is largely counterbalanced by its remarkable power of multiplying, which enables it to appear at times in blood films or to provoke extensive skin rashes in septicemic cases. As soon as the body develops some general immunity, the meningococci in the circulation are impaired in vitality and soon are completely destroyed. However, a marked difference in virulence in various epidemics occurs.

DISSEMINATION

Meningitis is disseminated through the medium of healthy carriers. The meningococcus is found at some stage in the nose and throat of those ill with the disease in over 90 per cent of cases. It usually disappears in from five to fourteen days. Mathers and Herrold found that among 140 immediate contacts (tent-mates) of cases of meningitis, 27 per cent were carriers. Seven of these were persistent carriers. Of 15,257 men, members of organizations in which meningitis had occurred, 44 per cent yielded positive meningococcic cultures. They found two types of carriers: temporary and persistent. The persistent carriers, individuals yielding positive naso-pharyngeal cultures over a long period of time, were few in number and only rarely developed meningitis. In the cultures from these carriers the organisms were present in predominating numbers. The temporary carriers were more numerous, but their cultures showed few meningococci, which persisted only over a short period. The biologic type of meningococcus predominant in the camp epidemic at the time was identical with that among the chronic carriers; also the type found in the cases and in the immediate contacts was the same. These facts suggest that there is a close relation between cases of epidemic meningitis and carriers. They feel that the persistent or chronic carrier is especially dangerous. Gates reports that specific agglutinins have been found in the blood serum of chronic carriers, evidence that their relative immunity may be due to these antibodies.

MORTALITY RATE

The general mortality rate from this disease has been reduced from approximately 70 per cent before the introduction of serum to variously estimated figures of 23 to 35 per cent, since. These figures include cases in infants under one year of age. This high death rate may be due to several factors: (1) An extremely virulent organism causing a fulminating meningitis; (2) an organism of different type than those used in producing the serum; (3) late recognition of the disease. The last mentioned is certainly the most common. Meningitis occurring in infancy, however, is still carrying a decidedly higher mortality rate, approximately 45 to 50 per cent. The causes for this higher mortality are late recognition of the disease, and lack of resistance to the organism.

Gates has injected volunteers with a meningococcic vaccine and later demonstrated specific meningococcic agglutinins in their blood serum. I have come across no other reference regarding active immunization against the disease.

SYMPTOMATOLOGY

As to the disease itself there are four types:

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 14, 1930.

(1) The common type, usually seen in older children or adults; (2) the fulminating type; (3) the infantile type, and (4) the septicemic type. It may run an acute course, the patient either dying or recovering after the use of serum; it may be greatly prolonged so that many doses of serum need be given before recovery or death ensues; it may relapse after apparent recovery, indicating perhaps some walled off focus of infection; and there is a class in which blocking occurs at the base of the brain which is very apt to be fatal.

The symptoms of the average case are familiar to all. The onset is acute, frequently with a chill. There are fever and headache. The patient is irritable, restless, and vomits. Shortly, the typical signs of meningitis develop, notably hypersensitiveness, delirium, stupor, convulsions, rigidity of the neck, increased reflexes, irregularities of respiration, Kernig and Brudzinski signs.

The fulminating type is the most malignant form. It runs a very acute course and usually kills within a few hours to a day. The picture is that of a violent general sepsis that utterly overwhelms the patient. If these fulminating cases can be tided over the first forty-eight hours they may respond to treatment.

The infantile type is easily overlooked in its early stages, starting usually as an obscure fever with gastro-intestinal symptoms, followed by convulsions, strabismus, and bulging of the fontanel. The bulging fontanel is the most important finding.

The septicemic type has only recently been recognized. All fulminating cases with purpuric rashes are probably of this character. In addition there is another group with a prolonged febrile state, frequently arthritic symptoms, and a mild roseolar or petechial eruption, much resembling typhoid fever. These patients may develop meningeal findings later, though some never do and eventually recover.

The usual type of meningitis may become chronic. The symptoms of this condition are continued irregular temperature, decided emaciation, vomiting, hydrocephalic cry and convulsions. The cause of this picture is frequently a posterior basic meningitis with a collection of plastic exudate at the base sealing up the foramina and giving rise to a hydrocephalus.

Relapses occur at times, probably in 5 to 10 per cent of cases. Many of these are due to the fact that the patient is not entirely well at the time of his supposed recovery and the process flares up. Under active treatment they often clear up. The patient should not be discharged till the spinal fluid is normal and its culture negative.

Conjunctivitis accompanies the disease very frequently; the discharge may show meningococci. Herpes when present also may show the organism in smear. Irido-choroiditis, usually purulent, occurs at times.

Deafness is one of the common sequelæ. Hydrocephalus occasionally follows. Mental deficiency results much less often than would be expected.

THE ORGANISM

The causative organism of cerebro-spinal meningitis is the meningococcus, often spoken of as the diplococcus intracellularis of Weichselbaum. This organism is a quite typical gram-negative diplococcus. It is practically always found at some stage of the disease in the spinal fluid, and often in blood cultures. In the fluid it may be intra- or extracellular, the relation to the leukocytes depending to great extent upon the intensity of the disease and the response to treatment. In severe cases there are many organisms, mostly extracellular. In favorably responding or milder cases they are fewer and mainly intracellular. Culture of the fluid usually shows a growth in eighteen to twenty-four hours. The organisms are more likely to be found in the last portion of the fluid withdrawn. The results of a Gram stain are not always reliable. A definite diagnosis must never be made on the result of a stained smear; it must rest on the results of a culture.

Meningococci fall into two large biologic groups, the typical meningococcus (Group I) and the parameningococcus (Group II). A great variety of intermediate strains related to one or the other of the two large groups occur, however, and Gordon has classified these intermediates into two groups which he calls groups three and four. The biologic differences are of great importance, particularly in the identification of the organism and the produuction of a potent serum. The meningococci of groups one and two are responsible for seventy-five to eighty per cent of all cases of meningitis.

It is generally believed that the toxic substances derived from the meningococcus appear as a result of massive cell autolysis (endotoxin) though highly toxic filtrates may be obtained from cultures in which there has been comparatively little cell autolysis. Schwartzman has succeeded in producing skin reactions with filtrates of meningococcus cultures and in being able to neutralize them in a high percentage of cases with antimeningococcic serum.

The fluid withdrawn at the first puncture most often yields the organism. However, I have seen organisms appear *only after* the giving of the serum. The best culture medium for its growth is probably the dextrose semisolid agar as prepared by Gosling. In 89 consecutive meningococcic cases tested by her, growth was obtained in eighty-one; at times growth occurs in this medium only; frequently growth occurs here when a smear is negative for organisms. Growth occurs in from eighteen to ninety-six hours. The identity may be proven by agglutination and fermentative tests.

PATHOLOGY

The nose and throat are the portals of entry of the organism into the body. Meningitis is first a case of naso-pharyngitis. Invasion from the nose and throat may occur in two ways: (1) By direct infection from the nose through the lymphatics; (2) by a primary invasion of the bloodstream causing a meningococcus septicemia with secondary localization in the meninges. Most authorities now favor the latter course.

It is probable that there is a brief invasion of the meningococcus in the blood in practically all cases of meningitis. Herrick found positive blood cultures in 45 per cent of his cases. Other authors give the incidence as 25 per cent. The duration of the blood infection before the development of meningitis may be extremely short; the two may appear coincident, as in the fulminant cases; or it may be of days' duration. It is possible to have a septicemia without infection of the meninges. This is usually transient, perhaps not over a few hours, but on the other hand it may last for days or even months, at times to be followed by an acute meningeal invasion. Some cases never pass beyond the septicemic stage. Richmond reports twenty-one cases of which seven remained septicemic only. Even fulminating cases ending fatally may show no evidence of meningitis at necropsy. Septicemic cases are less frequently seen in children.

Before the entry of the organism into the cerebrospinal fluid is described it will be wise to describe the circulation of the fluid. The fluid is secreted principally by the choroidal plexuses in the lateral ventricles. It flows through the foramina of Monro from the lateral ventricles into the third ventricle, through the aqueduct of Sylvius into the fourth ventricle, and from here gains access to the cisterna magna and the basilar system of cisterns by way of the foramina of Luschka and Magendie. The cisterna magna may be regarded as the distributing center of the fluid, as from here it gains access to the other cisterns and to the cerebral and spinal subarachnoid spaces.

Absorption of the cerebrospinal fluid occurs through the arachnoid villi into the cerebral sinuses or into the veins of the meninges.

Present opinion points to the entrance of the organism into the central nervous system via the blood stream through the choroidal plexuses. To do this the usually efficient barrier of the plexus must break down. Many observers contend that the cortex is also involved primarily, along with the lining of the ventricles. Leukowicz believes we must consider meningitis as a primary ventriculitis (choroido-ependymitis) while the lesions of the meninges constitute only a secondary phenomenon. He believes that no autonomous meningitis can exist independently of the ventricular infection nor require a serum treatment on its own account. Rolleston and Dopter agree with this in part. The barrier of the choroid plexus is overcome through inflammation of the plexus itself, much as in the metastatic skin lesions before mentioned, weakening the epithelial lining of the plexus villi and allowing the organisms to pass through.

If the consistency of the brain is soft and flaccid, as exists in infants, the cerebral edema and condition of pressure soon results in an obliteration of the sulci of the cerebral convexity. In those parts of the subarachnoid spaces that have thus lost their connection with the ventricles the inflammatory processes disappear quickly, according to Leukowicz. If large purulent layers are already present in the sulci the pus disintegrates, young connective tissue grows in and forms sclerotic plaques. The sulci of the convexity being closed, removing the largest area of fluid absorption, the cisternæ of the base remain the only part of the subarachnoid space within the cranium communicating with the ventricles. Consequently these alone remain filled with pus. This type of block explains the pathogenesis of the posterior basic type of meningitis as seen in infants and its resultant hydrocephalus. Adhesions obliterating the basilar foramina can also bring about this picture.

With the progress of age, however, the consistency of the brain becomes more firm and resistant, and changes of configuration leading to obliteration of the sulci can develop only after long duration. The subarachnoid spaces of the convexity thus remaining passable for a long time, are the site of an active resorption of the fluid and also of an abundant accumulation of its cellular elements. As the drainage of the ventricles is sufficient, hydrocephalus does not soon develop. On the other hand, the brain, not being able to markedly change its configuration, suffers from the pressure exercised on it by the osseous cranial walls and manifests this by violent cerebral symptoms.

Another spinal type of block may occur, due to an edema of the cord. This spinal type is more common in infants and is related to the increased size of the cord in proportion to the size of the spinal canal at this age. Occasionally a condition of "dry canal" may simulate spinal or basilar block and must be differentiated from them.

DIAGNOSIS

The diagnosis of cerebrospinal meningitis rests upon the finding of the meningococcus in the spinal fluid. The fluid when taken early in the septicemic invasion stage may be perfectly clear and normal microscopically. However, several hours later, turbidity may be manifest. The usual meningococcic fluid is frankly turbid. As a rule there is a decidedly increased cell count running into hundreds or thousands per cubic millimeter. The cells are usually polymorphonuclear in type, though occasionally lymphocytes predominate. Lymphocytes are apt to predominate in the very early fluids. There is an increased amount of protein and a decreased amount of sugar present. The gram-negative diplococci are almost always to be found in varying numbers on smear, and grow fairly readily in suitable culture media.

The white blood count is of varying significance. There is practically always at least a moderate leukocytosis. In some epidemics, however, it is greatly increased, with a high percentage of polymorphonuclears. Richmond reports counts from twenty thousand to fifty thousand with 90 per cent polymorphonuclears. It is safe to state that in an unexplained fever with a white blood count of over twenty thousand, meningitis should be suspected.

The meningococcus may be found in blood culture. Special media such as ascitic broth, blood broth, or blood agar, should be used, as the organisms grow poorly in ordinary media. Blood cultures may be very important in the recognition and treatment of meningococcic sepsis.

THE SERUM

Before treatment is discussed a few words about antimeningococcic serum are in order. The serum is produced by the injection of horses with living or dead cultures of the meningococcus over a period of time, and systematic bleeding thereafter. All serums are supposedly polyvalent for the four different strains of the Gordon classification as specified by the Government. The serum of some laboratories contains antibodies for additional strains. The problem of determining the best method of preparing a serum of value against all strains of the meningococcus still is incompletely solved. It is possible that a serum prepared with the use of only the four Gordon strains may be more potent than one prepared with a greater number. It has been shown that the concentrations of the different types of antibodies varies with the period after injection that the horses are bled. The value of therapeutic serums may be tested by the use of several immunity reactions, of which the agglutination test seems to be the best. It, however, is not a consistently accurate measure of the serum's real therapeutic value.

The serum when prepared contains agglutinins, complement-binding antibodies, bacteriotropins or opsonins, and anti-endotoxins. Its effect is to injure the meningococcus, reduce it in numbers, alter its size and staining properties and render it more readily taken up by the leukocytes (phagocytosis). The disintegration products of the organisms are also neutralized by the anti-endotoxins of the serum.

TREATMENT

The symptom-complex of antimeningitis consists of symptoms of sepsis from the purulent inflammation, symptoms of meningeal irritation, and pressure symptoms from the collection of exudate in the ventricles and subarachnoid space. In treatment, sepsis must be combated by serum injection into the meninges, and the equally important hydrocephalic pressure symptoms relieved by withdrawal of spinal fluid. It may be accepted as a general rule that unless the serum is introduced directly into the meninges the course of the local conditions will be little affected. When blood stream infection is present, or presumably so, subcutaneous or intravenous serum is also to be used.

Treatment may be divided into two parts: (1) treatment with serum; (2) general management.

If we grant that the original site and "feeder" of the infection is in the ventricles, the logical aim is to provide a sufficiently intense serum reaction in the ventricles and to maintain it for several days till disappearance of the meningococci occurs. This does not mean that serum necessarily must always be given directly into the ventricle itself. Serum injected intraspinally by the lumbar route penetrates into the ventricles in quite a sufficient concentration in almost 80 per cent of cases. The concentration of serum in the ventricles shortly after lumbar injection is often as high as 10 per cent and even after twenty-four hours may still be from 1 to 3 per cent. Serum injected into the general circulation is secreted into the spinal fluid only in small quantities and very slowly so that its action in the central nervous system cannot be depended upon. All cerebrospinal meningitis, therefore, demands intraspinal treatment. When meningitis is suspected, lumbar puncture should be done at once. The old dictum "a cloudy fluid demands antimeningococcic serum until *definitely proven* other than meningococcic meningitis" still holds true. Failure to observe this rule is often costly, as treatment with serum is most likely to give results when given early in the disease, the earlier the better. No harm, other than obscuring the picture for a time, results from the giving of serum, if proper precautions are taken. Meningococci occasionally are not found in cloudy fluids for several days, during which precious time is lost. The mere giving of serum may serve to bring the organisms forth. Serum should be continued until the organism found is proven beyond question not to be the meningococcus.

Specific bacterial immune bodies, agglutinins, opsonins, and antibacterial substances are usually absent, or present only in very small quantities, in the cerebrospinal fluid in meningococcic meningitis. Immune substances of similar type have been demonstrated in the blood of meningitis patients, however.

When spinal puncture is performed enough fluid should be withdrawn to exceed by five cubic centimeters or more the amount of serum it is desired to give. This is a safe working rule. The serum given should be allowed to run in slowly by the gravity method. Neal has at times given more serum than the amount of fluid withdrawn when it has run in easily by the gravity method, carefully observing the patient during the procedure. This is not to be recommended to the average practitioner.

The amount of serum to be given at each intraspinal injection depends upon the age of the patient. Young infants may be given 10 to 20 c.c.; adults up to 60 c.c. The interval between the injections has varied in different hands from eight to twenty-four hours. As serum injected intraspinally does not entirely pass out of the subarachnoid space for twenty-four hours, a twenty-four hour interval seems logical. Neal has thought it probable that removing fluid at more frequent intervals might remove cells that had been stimulated to a high degree of phagocytic power and were therefore actively combating the infection. Since the serum has so little bactericidal power itself, the administration of large amounts at frequent intervals seems unnecessary to her, besides subjecting the patient to considerable added pain and discomfort. Sophian advises a twenty-four hour interval. However, when the increase of pressure is great, lumbar puncture for its relief may be done at more frequent intervals and serum given. In Neal's hands the twenty-four hour interval of injection has yielded a mortality of 23 per cent in a large series of patients, a mortality rate lower than the average.

The average case requires from four to eight injections although at times a good many more are necessary. There are two main guides to the continuation of treatment: (1) the findings in the fluid at each puncture; (2) the clinical condition of the patient. While the fluid has a tendency to become clearer macroscopically as the disease improves, it may remain quite turbid due to the excitation of leukocytosis by the serum itself. As the patient responds, the organisms in the fluid become less numerous and more frequently intracellular, frequently appearing clumped together and failing to grow in culture. Such findings in conjunction with clinical improvement of the patient are indications for cutting down on the frequency of injections to 36 to 48 hours. Serum treatment should be continued until spinal fluid smears are negative for bacteria and cultures from it show no growth, always being prepared to institute treatment again if the patient's condition becomes worse or the fluid findings retrogress. The spinal fluid cell count is not an accurate guide to the discontinuance of serum. It is frequently necessary to do one or more spinal punctures after serum is discontinued for the relief of pressure symptoms.

Reaction of spinal fluid injection.—The injection of serum is usually accompanied by pain referred to any or all of the region affected. It usually subsides by the end of the operation, though it may continue for several hours. Usually there is a drop in blood pressure, at times quite marked. Fluid may be withdrawn till the pressure is normal, which roughly corresponds to ten to twenty drops per minute. Shock occurring during or after injection is usually due to the injection of too large a quantity of serum, too rapid injection, or undue pressure excited during its injection, and at times calls for the immediate withdrawal of serum and fluid when possible. Adrenalin and atropin may be used.

Intravenous serum. — The general opinion seems to be that intravenous serum should be given only to those cases with evident sepsis as manifested by joint signs, rash, or positive blood cultures, or in the very early cases when the patient is presumably in the septic stage. It may also be given when no improvement occurs after thorough spinal and cisternal treatment. Herrick advised 80 to 150 c.c. per dose; other authors use 20 to 50 c.c. The dose may be repeated at twenty-four hour intervals for several days until improvement occurs. It must be remembered that intravenous serum is prone to elicit severe and even fatal reactions; this fact has led several authors to discontinue its use. Attempt at desensitization should always precede its administration. Serum may be given by the subcutaneous or intramuscular route with greater safety.

Cisternal treatment.—When there is clear indication of block, puncture of the cisterna magna and serum injection at this site is often of the greatest aid. It also may be used when treatment via the lumbar route is not giving results. I am not going to attempt to describe its technic; suffice it to say that it is not overly difficult. Its advantage lies in the fact that serum reaches the strategic points more surely than by the lumbar route. As a rule cisternal treatments are well tolerated by patients. The dangers of cisternal treatment are intracranial compression, a jamming herniation by release of pressure, hemorrhage over the medulla from trauma to the spinal veins, and trauma to the medulla or cerebellum from improper puncture. Such occurrences are rare with correct technic. It is well to remember that patients who show evidence of anaphylaxis do not respond well to intracisternal serum, possibly as a result of an edema of the brain.

Ventricular treatment.—Some feel that the ventricular injection of serum is superior to the cisternal injection, believing it less dangerous and even more efficacious. Particularly is this felt in the case of infants, where its performance is usually a rather simple matter. Use of the cisternal or ventricular routes, when indicated, should result in further lowering of the mortality.

Combined treatment.—Some authors routinely treat cases by a combination of lumbar and cisternal or ventricular injections with good results.

General care.—The general care of the patient must not be lost sight of. Sedatives are necessary for restlessness, elimination must be secured, the fluid and food requirements met. If necessary, tube feeding should be used. Saline subcutaneously may be administered. At times blood transfusion is valuable.

The patient should not be discharged until the spinal fluid and cultures are normal and he has been temperature-free for at least one week.

Other types of treatment.—The treatment of meningococcic sepsis without meningitis is intravenous serum. Richmond treats these cases by intraspinal injection as well and feels that it sometimes prevents meningeal infection.

Neal, Banzhaf, and their co-workers have used an antibody preparation made by concentrating the serum, partially purifying its antibodies by precipitation, and then redissolving in sodium chloride. The agglutinating power of this antibody preparation is much higher than the serum from which it is made. It is given intraspinally in doses of 20 c.c. every twenty-four hours. With such a satisfactory preparation their mortality in twenty-four cases was 12.5 per cent. Neal tells me in a personal communication that this procedure is still in an experimental stage.

An autogenous vaccine has been used in chronic cases both subcutaneously and intraspinally, with good results at times. The use of convalescent serum is barely mentioned in the recent literature and the value of this treatment I do not know.

PROGNOSIS

The earlier the diagnosis and institution of treatment, the better the prognosis. The spinal fluid sugar findings offer distinct prognostic aid. The normal fluid sugar content is forty-five to sixty-five milligrams per hundred cubic centimeters. Before treatment is instituted it drops as a rule to about twenty milligrams but with improvement it gradually rises until it becomes normal again about the ninth day. Both the fermentative action of the meningococcus and the glycolytic action of the polymorphonuclear leukocytes have been considered the etiological factors in the decrease of the spinal fluid sugar. In the fatal cases it remains low. In infants it is often as low as thirteen milligrams and increases much more slowly, not reaching normal during treatment. Caffey and his co-workers believe the slow return to normal in infants is due to the slower subsidence of the inflammatory cellular reaction which they exhibit.

Estimation of the spinal fluid chlorides does not give valuable prognostic information.

Change of serum.—When the patient does not show the expected improvement in spite of thorough treatment it is often wise to use a different serum. It has several times been shown that some brands of serum will not control certain epidemics. The agglutination test as a measure of a serum's effectiveness is not certain; one must depend on the therapeutic response in determining the value of the serum used.

Serum sickness occurs in about 70 per cent of all cases, usually from the fourth to the fifteenth day.

BIBLIOGRAPHY

1. Amoss: Notes on the standardization and administration of antimeningococcic serum. Jour. Am. Med. Assn., 69:1137, 1917.
2. Anderson: The lack of therapeutic value of antimeningococcic serum. Jour. Am. Med. Assn., 93:1613, 1929.
3. Benjamin: Serum treatment in cerebrospinal meningitis. Arch. Ped., 46:252, 1929.
4. Bennett: Diagnostic and therapeutic indications for cisternal puncture. Jour. Am. Med. Assn., 93:1060, 1929.
5. Bennett and Simmons: The serum treatment of meningococcic meningitis by combined cistern and lumbar injections. Nebraska State Med. Jour., 12:54; 1927.
6. Caffey, McLean and Sullivan: Endemic meningococcus meningitis, The quantitative sugar and chloride content of the cerebrospinal fluid during specific serum therapy. Jour. Am. Med. Assn., 88:1859, 1927.
7. Felix and Yunowich: The importance of polyvalence in the use of therapeutic antimeningococcus serum. Jour. Immunol., 9:193, 1924.
8. Flexner: Control of meningitis. Jour. Am. Med. Assn., 71:638, 1918.
9. Flexner: Mode of infection, Means of prevention and specific treatment of epidemic meningitis, Rockefeller Institute for Medical Research, 1917.
10. Flexner: Accidents following the subdural injection of the anti-meningococcic serum. Jour. Am. Med. Assn., 60:1937, 1913.
11. Fox: Meningococcus meningitis; Treatment by combined cisternal and lumbar medications. Wisconsin Med. Jour., 28:13, 1929.
12. Gardiner: A case of generalized meningococcus infection. Brit. Med. Jour., 1928, 3547, P. 1928; P. 1176.
13. Gates: A report on antimeningitis vaccination and observations on agglutinins in the blood of chronic meningococcus carriers. Jour. Exper. Med., 28:449, 1918.
14. Gosling: Isolation and cultivation of the meningococcus. Jour. Am. Med. Assn., 98:611, 1929.
15. Klemmer: A case of meningococcic meningitis treated by the lumbar, cisternal and ventricular routes. Atlantic Med. Jour., 31:242, 1928.
16. Leukowicz: Cerebrospinal fever: A new pathogenic conception and its importance for the specific treatment of the disease. Lancet, 2:487, 1924.
17. Leukowicz: The principles of serum administration in cerebrospinal fever and the results of treatment. Proc. Roy. Soc. Med., 18:70, 1925.
18. LaFetra: The diagnosis and treatment of meningitis in children. Atlantic Med. Jour., 31:732, 1928.
19. Levinson: The treatment of meningococcus meningitis. Jour. Michigan State Med. Soc., 28:572, 1929.
20. Litchfield: Treatment of bacteriologically negative purulent meningitis. Arch. Ped., 43:691, 1926
21. Mackay: Meningococcal meningitis in young children. Med. Jour. and Rec., 121:490, 1925.
22. Mathers and Herrold: Observations on meningococcus carriers and on the bacteriology of epidemic meningitis. Jour. Infec. Dis., 22:523, 1918.
23. McLean and Caffey: Sporadic meningococcus meningitis, sequelæ following specific serum therapy in infancy and early childhood. Jour. Am. Med. Assn., 87:91, 1926.
24. Middleton and Duane: Fulminating meningococcus septicemia without meningitis. Am. Jour. Med. Sci., 177:648, 1929.
25. Morch: Studies on antimeningococcus serum. Jour. Immunol., 9:25, 1925.
26. Neal: The treatment of epidemic meningitis. New York State Jour. Med., 1930, Jan. 15.

27. Neal: Service for meningococcic meningitis. New England Jour. Med., 202:859, 1930.

28. Neal, Jackson and Applebaum: Epidemic meningitis, A study of more than 650 cases with special reference of sequelæ. Jour. Am. Med. Assn., 87: 1992, 1926.

29. Neal, Jackson and Applebaum and Banzhaf: The possibility of use of antibody preparations in treatment of epidemic meningitis. Jour. Am. Med. Assn., 91:1427, 1928.

30. Neal and Jackson: Epidemic meningitis in the first three months of life. Jour. Am. Med. Assn., 88:1299, 1927.

31. Neergaard: Meningococcus bacteremia. Med. Clin. No. Am., 1925, Sept., P. 461.

32. Peet: Advanced meningococcus meningitis, Treatment by combined ventricular, cisternal and lumbar punctures. Jour. Am. Med. Assn., 86:1818, 1926.

33. Richmond: Some observations on cerebrospinal fever. U. S. Naval Med. Bull., 25:304, 1927.

34. Richmond: Leukocytosis in the early diagnosis of cerebrospinal fever. U. S. Naval Med. Bull., 26:77, 1928.

35. Raney: Epidemic cerebro-meningitis. Southwestern Med., 13:122, 1929.

36. Shwartzman: Therapeutic antimeningococcus serums, measurement of their neutralizing potency by means of the phenomenon of local skin reactivity. Jour. Am. Med. Assn., 93:1965, 1929.

37. Sophian: Epidemic meningitis. Jour. Missouri State Med. Assn., 26:207, 1929.

38. Sophian: Epidemic meningitis. Jour. Miss. State Med. Assn., 26:167, 1929.

39. Sophian: Epidemic meningitis. Jour. Missouri State Med. Assn., 26:126, 1929.

40. Sophian: Epidemic meningitis. Jour. Missouri state Med. Assn., 26:59, 1929.

41. Stookey, Elliott and Teachenor: The treatment of epidemic meningitis. Jour. Iowa State Med. Soc., 19:477, 1929.

42. Thornton: Meningococcal meningitis in infants and children, treated by Flexner's serum. Lancet, 213: 544, 1927.

43. Thursfield: Discussion on the causes, early recognition and treatment of non-tuberculous meningitis. Proc. Roy. Soc. Med., 18:1, 1925.

44. Viets: Meningococcus meningitis. Med. Clin. No. Am., 1925, Boston No., P. 1841.

45. Womback: Meningococcal meningitis treated with cisternal puncture. Med. Clin. No. Am., 11:1299, 1928.

46. Wright, Desanctis and Sheplar: The determination of the value of serum in the treatment for meningococcus meningitis. Am. Jour. Dis. Child., 38:730, 1929.

DIFFUSE SUBCORTICAL SCLEROSIS OF THE BRAIN*

J. Charnley McKinley, M.D., Ph.D.
Minneapolis

THE confusion of classification and terminology which surrounds the concept of diffuse cerebral sclerosis and the lack of sufficient fundamental data with which to clarify our concepts justifies the reporting of further individual cases of the condition. During the time in which the number of reported cases is small, the publication of additional cases will likely increase this confusion; but at least it will tend to break down insufficiently grounded nosological hypotheses, though it may leave little in the way of satisfactory understanding in their place. Nevertheless, we shall probably eventually acquire through such reports a sufficiently large series of cases so that the more obvious features of the disease can be seen with reasonable perspective, whereupon our terminology can be constructed with sufficient logical basis, such that some general acceptance of terms may be attained.

Coinage of names for the condition and its types has been indulged in by various writers to such a point that one becomes quickly disoriented in the maze of words one might be expected to keep in orderly array for the condition and its variants. For example, the following terms have all been proposed as the most suitable for one or another phase of the condition or for the condition itself:

1. *Encephalitis periaxialis diffusa* or Schilder's disease. The term was introduced by Schilder[1] in 1912 to designate a type of diffuse cerebral sclerosis involving the white matter of the hemispheres in childhood and separated from the diffuse gliomas of the brain. He assumed a toxic etiology which justified the implication of brain inflammation in his terminology. Bielschowsky[2] limits the term to such cases of cerebral sclerosis as show strong evidences clinically or pathologically of an inflammatory process. He presents such a case. Other writers (for instance Bouman[3] and Collier and Greenfield[4] and several Americans) have applied the term to cases which they considered primary degenerative. Ferraro[5] presents his cases as the "familial form of encephalitis periaxialis diffusa"; thus hereditary forms have also been classified under Schilder's terminology.

2. *Progressive degenerative subcortical encephalopathy.* This term was suggested by Globus and Strauss[6] to supplant Schilder's term of encephalitis periaxialis diffusa. Globus and Strauss obviously considered the condition as primary degenerative.

3. *Symmetrical centro-lobar cerebral sclerosis* (La sclérose cérébrale centro-lobaire a tendance symétrique) is the term used by Foix and Marie[7] to mean a chronic form of encephalitis periaxialis diffusa of Schilder, or a form which may come to spontaneous arrest.

4. The term *aplasia axialis extracorticalis congenita* (Pelizaeus-Merzbacher disease) is properly applied, according to Liebers,[8] only to cases occurring in a single family which has been reported through four generations by Pelizaeus, Merzbacher, Spielmeyer and Liebers. The condition occurred in fourteen members of the family and in each case ran a chronic course after an onset in infancy.

5. Krabbe[9] described a *familial infantile form of diffuse brain sclerosis* with an acute course.

6. For the hereditary forms in general of primary degenerative diffuse sclerosis involving the subcortical white matter, Bielschowsky and Henneberg[10] have introduced the designation *leucodystrophia cerebri progressiva hereditaria.*

It is hoped that the present report will not add to the confusion.

PRESENTATION OF A CASE

A white boy, aged 2.5 years, was admitted to the Pediatrics Service of the University Hospital November 11, 1929. His birth was normal. He weighed eight pounds at birth. He was breast fed for nine months. Child was perfectly well until July, 1929, at which time he weighed twenty-six pounds. Since that time the weight has been stationary. Sat up at 8 to 9 months; walked at 1.5 years; had his first tooth at 17 months; had sixteen teeth at the time of admission. He began talking at one year but has never talked very much. Since the onset in July, 1929, the patient has ceased speaking altogether. It was noticed by the parents that the baby fell down frequently without stumbling; later was entirely unable to maintain his balance. Shortly thereafter he became unable to walk at all, and in August he could not crawl. At that time stiffness of both legs was noticed, and a short time later he could sit only with difficulty, being obliged to double his legs under him (squatting) to maintain his trunk in the erect position. Since early in October he has been unable to use his hands and arms. Both extremities are kept extended and no voluntary movements are made. The head has been held in opisthotonos for some weeks.

---

*From the Division of Nervous and Mental Diseases, University of Minnesota Medical School, Minneapolis. Presented before the Minnesota Academy of Medicine, October 8, 1930.

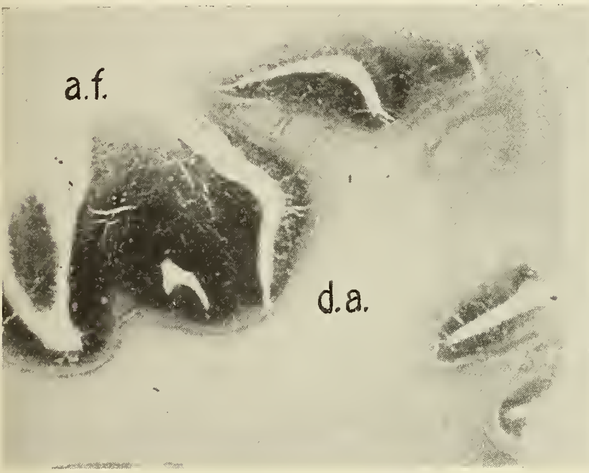


Fig. 1. Left frontal area of brain. a.f.—arcuate fibers. d.a.—degenerated area, the subcortical white matter. Weigert's myelin sheath stain. X 2.

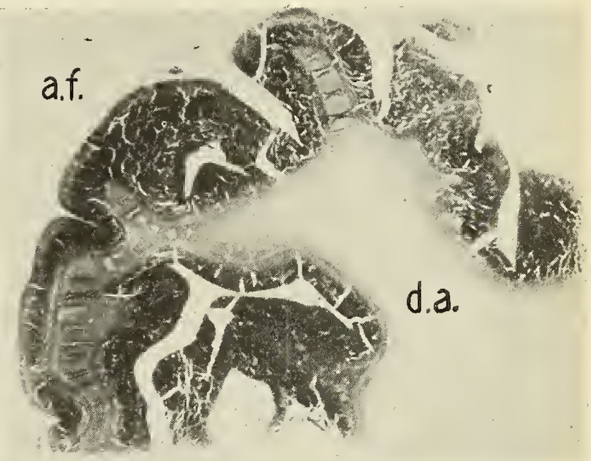


Fig. 2. Left parietal area. a.f.—arcuate fibers. d.a.—degenerated area, the subcortical white matter. Weigert's myelin sheath stain. X 2.

There was no previous illness. Father and mother are both living and well. They are cousins. The mother had an operation for goiter. The patient is the second child.

A brother lived to the age of 2 years 9 months and became ill much like the patient, developing speechlessness. He was never able to walk and became spastic in all extremities before death and died finally of bronchopneumonia.

Examination.—Physical examination by the pediatricians showed fair development but slight emaciation. The pupils were fixed to light and dilated. The eyegrounds were negative. Throat and mouth showed no pathology. Heart, lungs and abdomen were normal. All the extremities showed atrophy of the muscles. The reflexes were increased in the upper extremities. Reflexes could not be obtained in the lower extremities because of spasticity. Both lower extremities were very spastic and held in constant extension.

Laboratory findings.—Blood examination showed hemoglobin 91 per cent, red blood cells 4,910,000, white blood cells 11,000, polymorphonuclears 40, lymphocytes 58, monocytes 1, eosinophiles 1 per cent. Spinal fluid: normal pressure, Wassermann negative, colloidal gold curve negative. Urinalysis showed a few red blood cells and a few white blood cells; otherwise the urine was normal. As the patient was admitted for diagnosis only, no therapy was attempted.

The writer examined the child neurologically November 14, 1929. The examination was unsatisfactory. The child cried perpetually and could not coöperate in the least. He appeared completely demented. He lay in opisthotonos with the legs extended and arms abducted. The pupils were completely dilated as though by homatropine. They were fixed to light. No facial paralysis was present. The cranial nerves were otherwise not satisfactorily examined. The reflexes were not obtainable because of the marked spasticity in all extremities. He moved the arms very little though he could grip with his fingers. The legs were moved freely but were extremely spastic, with adductor spasm. The toes were continually in the position of a positive Babinski. Clonus could be elicited in the right foot. The condition was thought to be probably diffuse cerebral sclerosis. The patient died December 17, 1929.

Postmortem examination.—This was performed about twelve hours after death. The body was that of a fairly well developed, rather poorly nourished baby boy, 88 cm. long and weighing about thirty pounds. Rigor was very marked; purplish hypostasis was present posteriorly. Slight cyanosis was present. There was no edema or jaundice.

The peritoneal cavity was normal. The appendix was free and anterior. The pleural cavities were normal. The pericardial sac was normal; it contained no excess of fluid. The heart weighed 60 grams. All the chambers and valves were normal. There was no anomaly of the vessels. The root of the aorta was normal. The thymus weighed 20 grams and was normal grossly on the surface and on section. The left lung weighed 170 grams, the right 200 grams. Both were nodular and congested throughout and pus could be expressed from both on section. The spleen weighed 40 grams and was normal grossly. The liver weighed 360 grams and was slightly pale; otherwise entirely normal. The gallbladder was normal. The gastrointestinal tract, pancreas and adrenals were normal. Each kidney weighed 40 grams and there was slight cloudy swelling. The bladder and genital organs were normal. The aorta and lymph nodes were normal.

At autopsy no abnormalities of the brain were noticed. The brain was cut into coronal sections at the time and was delivered in this condition to the neuropathology laboratory. Here no gross abnormalities of the surface of the brain were seen. Palpation of the brain substance showed a marked increase of consistency, especially in the white matter underneath the cortex. This increased consistency was not uniformly diffuse but could be felt more under certain convolutions than under others, though there was no tendency for the firmness to be more marked in one or another lobe of the brain. Sectioning the brain with a razor produced the sensation of cutting a sclerotic organ as compared with normal brain.

Microscopic findings.—The accompanying figures illustrate fairly well the essential features of the microscopic pathology. Figures 1 to 4 show Weigert sections of various parts of the cerebral cortex and the basal ganglia. It appears at this low magnification that the myelin sheaths of the centrum semiovale are practically absent. Immediately beneath the gray matter of the cortex is a fine strip of remaining undegenerated myelin sheath fibers following the topography of the base of the cortex. These are arcuate or U fibers of the cortex running from convolution to convolution. It has often been stated that the arcuate fibers are not degenerated in Schilder's disease. However, one sees with the high power of the microscope that not only are the arcuate fibers not degenerated in this area but also the fibers running vertically between the cortex and the centrum semiovale. Thus the preservation is evidently not a system preservation but a regional one with which we are dealing. In Figure 4 the degeneration can be seen extending down into the internal capsule. The fibers of the globus pallidus and putamen are rather markedly degenerated. The fibers of the thalamus appear to be less numerous than is normal. Under the high power the subcortical white matter is seen to be extremely degenerated as regards myelin sheaths with the exception of the arcuate fibers. Only a scattered number of them remains (Figs. 5 and 6). With Bielschowsky's stain for nerve cell processes it is seen that about as many axis cylinders persist as there are myelin sheaths (Fig. 7). Sections of the pons, medulla and spinal cord (Fig. 8 and 9) are of no particular interest excepting that the pyramidal tracts are degenerated as an apparent secondary degeneration and in the medulla the myelin sheaths in general appear to be somewhat scanty.

Cellular stains of the cortex show that the cells of the superficial layers are about as numerous as one ordinarily finds and are well preserved (Fig. 10). The cells in the 6th and in the deeper parts of the 5th cortical layers are less numerous than normally and are undergoing definite degeneration as shown by chromatolysis, fragmentation and nuclear abnormalities. The cells of the globus pallidus are distinctly degenerating and less numerous than normally. In the putamen the cells appear to be about normal. In the thalamus they are apparently moderately decreased in number. The cells of the third nerve nucleus and of the substantia nigra are likewise moderately decreased in number and show degenerative changes. In the medulla the cells are normal except for those of the inferior olive, which are rather strikingly reduced in number; those remaining show only mild evidences of any degenerative process. In the spinal cord the nerve cells appears to be about normal.

Hematoxylin and eosin sections of the white matter beneath the cortex (Fig. 11) show a rather marked increase in the number of glial cells in the region. A large proportion of these glial cells is made up of protoplasmic glia. These cells constitute an unusual picture in that the markedly increased cytoplasm appears homogeneous except at the periphery of the cells, where it is extremely grandular. The granules stain deep red with eosin. Some of these cells appear to have undergone a partial disintegration. Staining by the various silver carbonate methods to bring out the different types of glial cells shows that the vast majority of the glia is made up of astrocytes. The astrocytes have increased in great number and their processes, running in every direction, make a heavy network of coarse glial fibers. It is undoubtedly this increase in astrocytes and their fibers which is responsible for the increased consistency of the white matter of the brain (Figs. 12 and 13). The

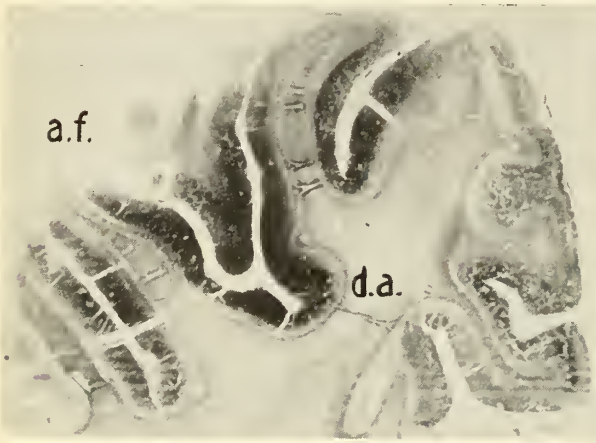


Fig. 3. Left occipital area. a.f.—arcuate fibers. d.a.—degenerated area, the subcortical white matter. Weigert's myelin sheath stain. X 2.

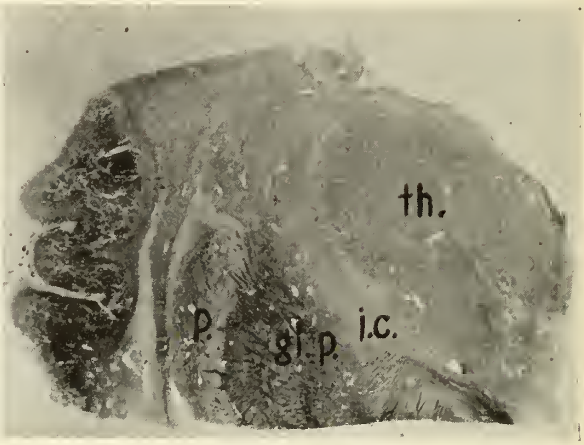


Fig. 4. Right basal ganglia. gl.p.—globus pallidus. i.c.—internal capsule. p.—putamen. th.—thalamus. Weigert's myelin sheath stain. X 2.

increase of astrocytes is most marked in the region of the cortical arcuate fibers which have not yet undergone extreme degeneration.

Various parts of the brain were stained with Sudan III to demonstrate fat. This can be seen piled up in scavenger cells along blood vessels in scattered areas. It can be found in glial cells in small amounts though it is sometimes collected in large amounts in the large protoplasmic glial cells (Fig. 14). Fat-containing glial cells are more abundant in the region of the cortical arcuate fibers than elsewhere in the white matter. Increase of astrocytes in the basal ganglia and likewise in the midbrain is a distinct part of the picture microscopically.

The vessels of the brain show only mild abnormalities. These are evidenced by the collection of scavenger cells in the adventitial spaces along with small numbers of perivascular lymphocytes. The vessels are not thickened and there are no evidences of thromboses. The meninges appear normal throughout.

RECENT CASES FROM THE LITERATURE

Bouman,[3] Collier and Greenfield,[4] Stewart, Greenfield and Blandy,[11] and Globus and Strauss,[6] have reviewed the early literature of Schilder's disease so that it is unnecessary at this point to go over these early cases. These authors together have reported and reviewed about 48 cases. In the present paper I shall review 15 cases that have appeared subsequently to the articles by these writers, or cases which they did not include in their reviews. Together with the personal case reported by me, the total number of pathologically verified cases of diffuse subcortical sclerosis is thus 64. Parts of the following reports are taken verbatim from the former writers. Only those used entire are enclosed in quotation marks.

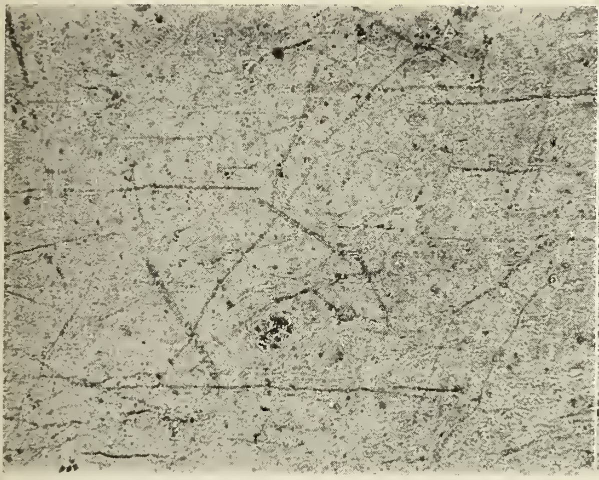


Fig. 5. White matter of left occipital region where myelin sheaths are very sparse. Weigert's myelin sheath stain. Magnification about X 150.

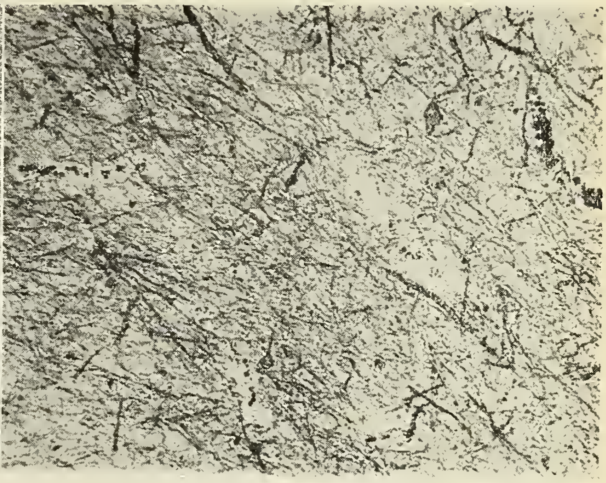


Fig. 6. White matter of left occipital region in the area of the arcuate fibers. Weigert's myelin sheath stain. Magnification about X-150.

No. 1. Schilder,[12] 1924. Female, age 37. One month after an attack of grippe, the patient lost her sense of smell on the left side. Incontinence of urine appeared and the patient developed headaches. She became markedly constipated. The menses of the fifth month after onset were premature. First examination five months after the onset of the trouble. This showed an objective left-sided decrease of smell with negative findings in the nose. Apraxia of the eyelids and to a less degree in the upper region of the face was present. There was a slight right-sided hemiparesis of the pyramidal type. An uncharacteristic tremor of the hand was present, more pronounced on the right side than on the left. The patient tended to fall backwards in a retropulsive fashion, which carried with it, however, a certain apparent voluntary character. Bilateral beginning choked disk was present. Psychically the patient was apathetic, dull and showed a lack of initiative and interest. She was incontinent. A presumptive diagnosis of brain tumor was made and the patient was operated upon. She died about eight months after the onset.

No. 2. Scholz,[13] 1925. This writer has reported the clinical findings of five cases out of a single familial group. Only his second case has been described pathologically. Consequently, it is the only one which will here be summarized.

The hereditary features of Scholz's cases are so complicated that they will not be repeated here. The patient developed normally until the age of eight years, when he became ill with a severe headache and vertigo, with decrease of his mental activity, slowing of speech and spastic paralysis of the extremities, together with a slight sphincter involvement. At the same time he had only a slight decrease of his visual acuity with a correspondingly slight pallor of the temporal halves of the optic disks. Examination early in the disease showed a spastic paralysis of the extremities, slight cranial nerve symptoms and negative spinal fluid. Multiple sclerosis was considered most likely. A half year later he had a total right-sided spastic paralysis with beginning contracture of the fingers and a high grade spastic paralysis of the left side of the body. He also had very evident paralytic phenomena in the cranial nerves and marked disturbances of the sense of touch. Vision had grown much worse; speech was slow and painstaking. Three months later he was completely helpless in bed; shortly thereafter could not speak at all and chewing and swallowing became very poorly performed. He developed severe spastic contractures. One year after the onset he developed attacks of muscle spasm in the extremities associated with crying, apparently because of pain with the spasms. The patient was gradually becoming demented. About three years after the onset he first showed generalized clonic convulsions with loss of consciousness and vomiting over several days at a time with each attack. After four years he no longer reacted to auditory stimuli and gradually became weaker. Was first seen in Scholz's clinic in the second half of the fifth year of the disease. Was now completely demented; reacted only to severely painful stimuli with crying and with indications of flight and protective movements. Neurologically, as concomitant signs of the spastic paralysis, there were increased reflexes, clonus, pathological great toe phenomena. It was noted that on the right a partial, and on the left a total optic atrophy was present. Spontaneous chewing and sucking movements were present and could be brought out by touching parts of the mouth. Swallowing was purely reflex only after touching the soft palate. Also in Scholz's clinic there were noticed painful spasms of the extremities. April 21, 1922, fifteen days after coming into the clinic, he died with bronchopneumonia after an onset four years and ten months previously.

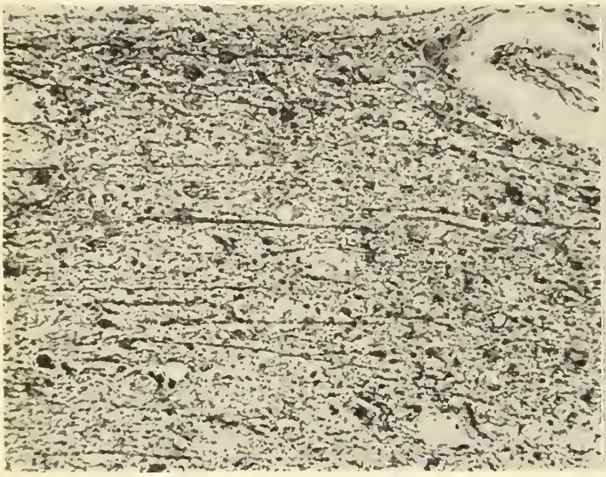


Fig. 7. Deep in the white matter of the right parietal region where myelin sheaths are sparse. For comparison with Figure 5. Bielschowsky's neurofibrillar stain. Magnification about X 150.

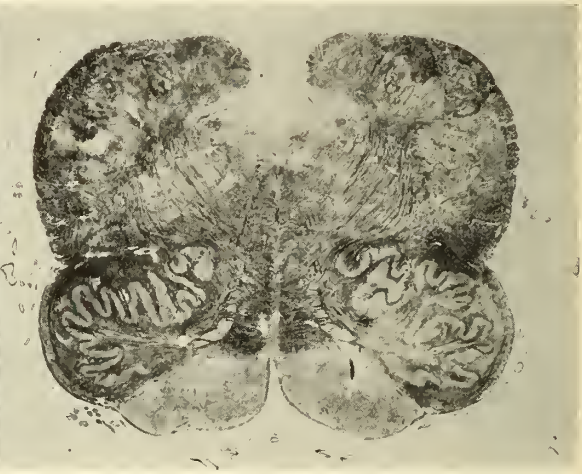


Fig. 8. Medulla oblongata. The pyramidal tracts are markedly degenerated. Weigert's myelin sheath stain. X 4½.

No. 3. Kraus and Weil,[14, 15] 1926 and 1928. Case was that of a Hebrew tailor, born in 1877, whose family and past history were unimportant. In 1911 while walking in the street, the patient suddenly fell to the ground helpless and could not get to his feet again without assistance. There were no convulsions and no loss of consciousness. Sensory disturbances, ataxia, and anesthesia to touch were noted in all four extremities, but disappeared after a few weeks. The cranial nerves were normal with the exception of slight deviation of the protruded tongue to the right. In December, 1911, there was slight concentric contraction of the visual fields. At this time he also showed: diminished sense of smell; a slight tremor of the hands; ankle clonus which was persistent on the right, exhaustible on the left; persistent knee clonus on both sides; the upper abdominal reflexes were present, the lower were absent on the left; a pseudo-Babinski sign on the right and markedly exaggerated knee jerks; no ataxia; occasional incontinence of urine. Condition remained unchanged for five years. He was re-examined in 1921, at which time the same neurologic status was revealed, with an increase of the eye disturbances, insufficient convergence of the right eye, weakness of the rectus internus and externus on both sides, irregular pupils with reaction to light but none to accommodation. The right arm was weaker than the left and the biceps and triceps reflexes were lively on both sides. There was slight ataxia of the left arm, marked ataxia of the right, and ataxia of both lower extremities with loss of sense of position of the toes. A marked Romberg sign was present. There were no sensory changes. The gait was peculiar; it required a cane and was characterized by small steps and shuffling of the feet. Every time the foot touched the floor there was hypertension at the knee. Speech was very rapid and scanning with a peculiar repetition of the last word of each sentence. The condition was progressive and in July, 1923, the patient could not stand or walk. There was a mild degree of dementia. In March, 1924, complete left hemianesthesia was noted. In June, 1924, the patient died after an acute attack producing left-sided convulsions and anesthesia.

No. 4. Ferraro,[5] 1927. Case 1. Woman. Age at death in 1925, 32. Onset in 1913 at the age of 20, following a severe burn. Behavior has been queer since then. She thinks someone has cast a spell over her. She refuses to wash or bathe herself or to comb her hair. She is forgetful, leaves the change on the counter, talks in her sleep and to herself; is a spiritualist. In 1919 it was noticed that she was somewhat intellectually and emotionally deteriorated; knee jerks very active; pupils dilated, rather irregular, sluggish to light, especially on the right; decided Romberg present; tremor of the facial muscles and fingers; speech ataxic; gait shuffling; Babinskis negative; no sensory disturbances; mild leukocytosis of the spinal fluid; Wassermann on blood and spinal fluid repeatedly negative.

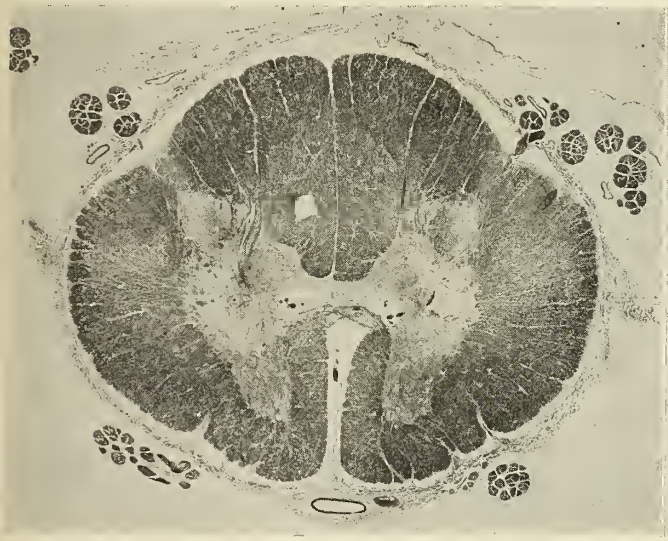


Fig. 9. Upper lumbar cord. Pyramidal tract degeneration. Weigert's myelin sheath stain. X 9.

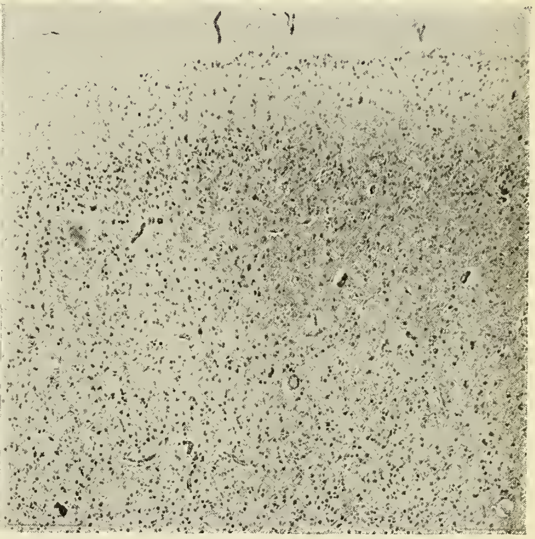


Fig. 10. Right parietal cortex. Thionin. Magnification about X 16.

The patient's parents were separated. Two brothers are said to have had "multiple sclerosis" (see the following two cases). Maternal grandmother insane, maternal cousin feebleminded. The patient was backward in school but social life normal. The neurologic symptoms progressively increased. In January, 1925, she was anemic and weak and had developed severe bed sores. Her speech was monotonous and sing-song. There were involuntary grimaces and distortions of facial muscles. Intention tremor was very marked. There was no nystagmus. She died in 1925 with a clinical diagnosis of multiple sclerosis.

No. 5. Ferraro,[5] 1927. Case 2. The patient was a brother of case 1. He was born in 1889. Except that he had never held a position for very long, his past history was essentially negative. He was drafted into the army in 1918. While at camp, about July 1, 1918, he began to be lame. He felt nervous at this time. Was discharged from the army as physically unfit in August, 1918.

While in the army camp he had begun to develop a paranoid trend. After leaving the army, he began to hear hissing noises in his ears and later had actual auditory hallucinations. He also began to have at this time explosive outbursts of laughter. He entered Belview Hospital at his own request in September, 1919, claiming that he felt nervous, that he was very emotional and that his memory was not so good as formerly.

Examination showed the pupils somewhat irregular, but reaction to light was fairly prompt, though diminished in extent; the eyes were somewhat unsteady when he looked to the extreme right or left, but no clearly marked nystagmus was present. There was bitemporal pallor of the optic disks with contraction of the arteries and veins. His hearing was rather dull and he complained of a loud hissing in both ears. Cremasteric and abdominal reflexes were difficult to elicit though not entirely absent on either side. Babinskis negative. Muscular strength poor, but equal on both sides. The left side of the face was slightly flatter than the right, the tongue deviated slightly to the left, the gait was unsteady with the feet occasionally scraping the floor when walking, especially on the left side. All the muscular movements were clumsily performed, though the sense of position was not lost. Romberg sign negative. The fingers, tongue and lips were all fairly steady. No definite speech defect. Blood and spinal fluid Wassermann negative. Globulin + + in the spinal fluid. The first spinal fluid test showed one cell, the second showed five.

Mentally the patient was dull and indifferent. He said that he felt depressed at times, but qualified this by saying he felt cheerful even when he was sad. He often laughed in a silly manner which he could not control. He still had hallucinations, memory was good for both recent and past events. He seemed rather childish and his judgment was poor. He died March 30, 1924, of bronchopneumonia. The neurologic diagnosis was multiple sclerosis.

No. 6. Ferraro,[5] 1927. Case 3. The patient is the brother of the two first cases. He was born in 1884.

No serious abnormalities of his development were noted until nineteen years of age, when he ran away from home. He stayed away for two years, working about the country in various places without much progress. At the age of twenty-one he fell a distance of sixteen feet, landing on his back. A week later he had difficulty in walking. His foot appeared to be paralyzed and he had a staggering gait. He also became nervous and had spells of involuntary laughter. He was placed in a hospital, where he was somewhat hypochondriacal. He laughed without cause and explosively. The general examination was negative except for a slight dullness and prolonged expiration over the apex of the right lung. Urinalysis was negative. The tendon reflexes were all greatly increased. Ankle clonus present on both sides. Babinski phenomenon present on the right side. Superficial reflexes were absent. Station was good but the finger-to-finger and finger-to-nose tests were badly performed. His gait was stiff and awkward. The pupils were dilated and reacted to light and accommodation. He was unstable emotionally and seemed to be fluctuating between depression and exhilaration. On one or two occasions he threatened suicide. He was then paroled from the institution. In 1909 he developed a trophic ulcer on the left anterior tibial surface. In 1910 his health was fairly good and mentally he was in exactly the same condition as previously. The neurologic examination was the same as formerly except that the Babinski tests were positive on both sides, the gait was spastic in type, there was marked incoördination of the movements of the lower extremities, a coarse tremor was present which became more marked when fine movements were attempted. The speech had also become jerky in character and was termed scanning. In 1911 it was noted that he had become more unsteady in walking and occasionally fell. In 1912 he developed bowel and bladder incontinence. A spinal fluid test was done in May, 1914. The Wassermann, gold sol reaction and Nonne were negative. Cell count, 58 per cubic mm. Blood Wassermann, negative. He developed large bed sores and gradually became weaker until the time of his death, Oct. 26, 1916.

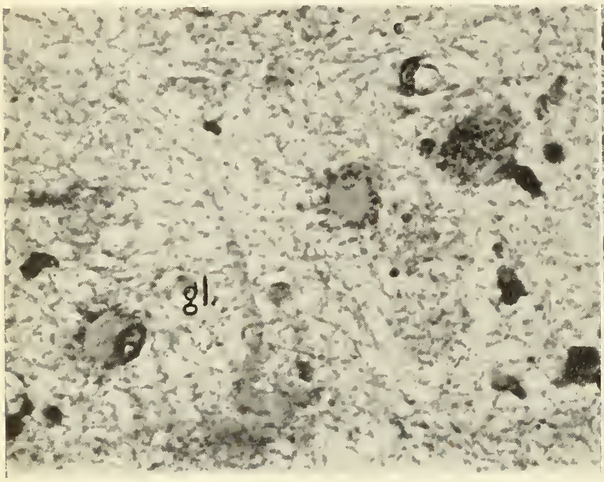


Fig. 11. White matter of right second frontal convolution. gl.—glial cell with much cytoplasm and peripherally arranged eosinophilic granules. Hematoxylin and eosin. X 300.

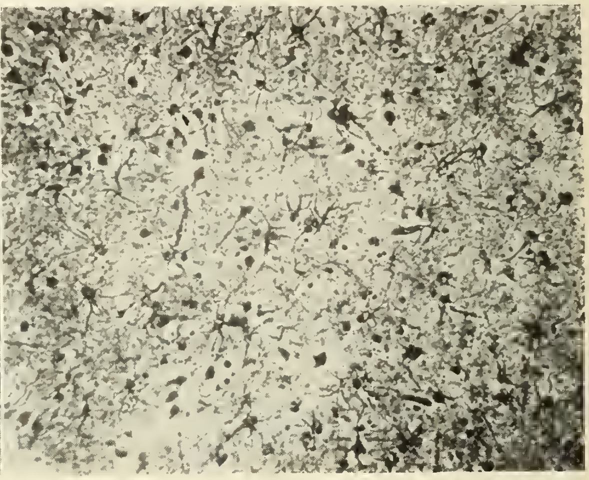


Fig. 12. White matter of left frontal region. Numerous glial astrocytes present. Hortega's silver carbonate stain for astrocytes. X 100.

No. 7. Schaltenbrand,[16] 1927. "A girl, aged 14, came into the clinic because of headaches and pain in the right lower abdominal quadrant. The patient's mother has a depressive climacteric psychosis and the grandmother has suffered for years from a paranoid psychosis. On admission the patient was apathetic. She had a right facial weakness and hyperemia of the optic disk. During the next few weeks, she developed hypotonic right-sided hemiplegia, hypesthesia for touch and pain over the whole right side, right hyposmia, and left homonymous hemianopia. Shortly afterwards, a motor and later also a sensory aphasia appeared. The choking of the disks gradually increased during the next few weeks to from 4 to 5 diopters. Meanwhile the left leg became paralyzed, and all the paralyses slowly acquired a spastic character. The right arm went into flexion contraction. The head and eyes became strongly deviated, at first to the right and later to the left. Finally, the patient became entirely blind, aphasic and almost completely paralyzed, though in the left arm certain movements, athetoid in character, put in an appearance."

"One lumbar puncture gave negative results; another, a slight increase of globulin and 10 cells. The blood picture was normal, with the exception of a slight leukocytosis. The patient grew worse in spells which were accompanied by a subfebrile temperature. The disease lasted three months altogether."

No. 8. Bielschowsky,[2] 1927. The patient was born in 1868. His family history showed that his antecedents were a nervous type, otherwise normal. He, himself, is said to have had a tendency to fits of rage in the past. As a youth he had a middle ear inflammation with subsequent decrease in his hearing. Otherwise was well until the period 1918 to 1920, during which time without apparent cause all of his teeth fell out. In September, 1920, at the age of 52, he was sick for ten days with fever, chills, joint pains and lassitude. Three weeks later he again had a febrile illness. He is said to have had yellow scleræ. The sickness was first considered malaria and then later an intestinal intoxication. There were no nervous symptoms. The patient has been impotent since this illness. In 1923, he was denied coverage for life insurance because his pupils had become unequal and reacted poorly. Later special investigation did not substantiate this finding. In June, 1924, he had another attack of febrile illness which lasted off and on until the first week of July. August 8, 1924, he was again taken sick, with confusion, weakness, inability to speak. The following day his temperature rose 1° to 2° C and he recovered on the fourth day. Examination on the fifth day was negative neurologically except for a positive Oppenheim reflex on the left. There was a hypalgesic zone on the left leg and a hyperalgesic zone at the nipple level running around the trunk. The patient swayed somewhat in turning abruptly on his feet even though his eyes were open. The visceral examination was essentially negative except that the liver edge could be palpated. Blood counts normal, no malaria, the Wassermann reaction normal. August 11 the sensory disturbance in the left lower extremity disappeared and the liver edge could no longer be palpated. September 1, 1924, he came home extremely tired and much agitated; the next day he complained of headache; the temperature was normal. September 3, he had an afternoon temperature of about 1° C. He complained of severe headaches, he was very difficult to awaken in the evening and was quite stupid. September 4, the temperature was 39.2° C. Slept most of the time, could be awakened, however; had a nearly complete motor and sensory aphasia. He could not even say his own name at times. When he did speak he used Spanish, though his mother tongue was German. An exact examination was impossible. He appeared not only temporally and spatially disorientated but also apractic. He was negativistic and incontinent. In the afternoon his sensorium was entirely clear. He had a slight paraphasia and perseveration. Examination was essentially negative, excepting that he had evident though not very marked spasms. The Babinski and Oppenheim signs were positive on the left and the abdominal reflexes were weaker left than right. He had a complete amnesia for the time of fever. September 5, he had slight spasms in all the extremities, especially in the adductors of the thigh, so that he had a cross-legged progression. He could take a few steps with help, but tended to fall backwards with the eyes open or closed. His gait was ataxic. There was no ataxia in the arms. He could not tell when his bladder was full and recognized that his water was passing only when the skin of his thigh became wet. September 8, felt perfectly well. Was examined eight days later by Professor Cassirer, who found absolutely nothing wrong with the patient. On September 25, after having meantime worked at his profession as an engineer, he came home complaining of weakness and appeared rather dull. He complained of severe headache, was restless during the night, an exophthalmos appeared, he was incontinent and during his attack bit his tongue. His left arm went into a definite convulsive movement. This lasted ten minutes and he had a second attack later in the night. Was taken to the hospital and his mental condition cleared up during transportation to the hospital. Two hours later he became somnolent, vomited and, although he seemed clear mentally, he occasionally could not find the word for which he sought. Examination September 26: General examination negative. Skin negative. The scleræ show a slight subicteric tinge. The pupils were slightly unequal, possibly somewhat irregular. The right pupil appeared to react somewhat slowly to light. Abdominal reflexes absent; two hours later, present. The left one was, however, the weaker. Sensation normal excepting in the left mammillary zone where sensation for sharp and dull was decreased. Definite rigidity present in

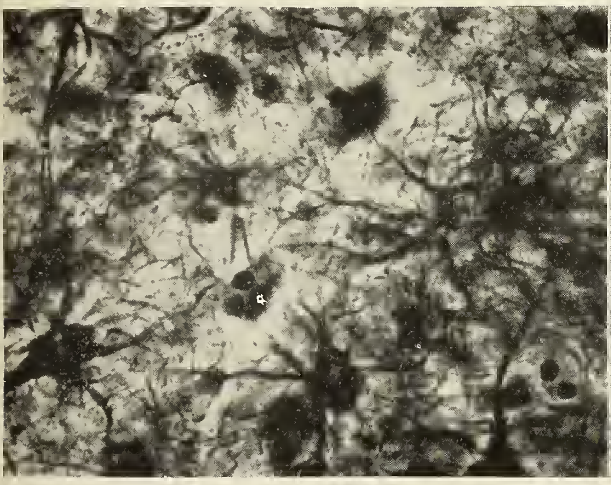


Fig. 13. Same area as in Figure 12. The coarse ramifying fibers of the astrocytes make a dense network. X 400.

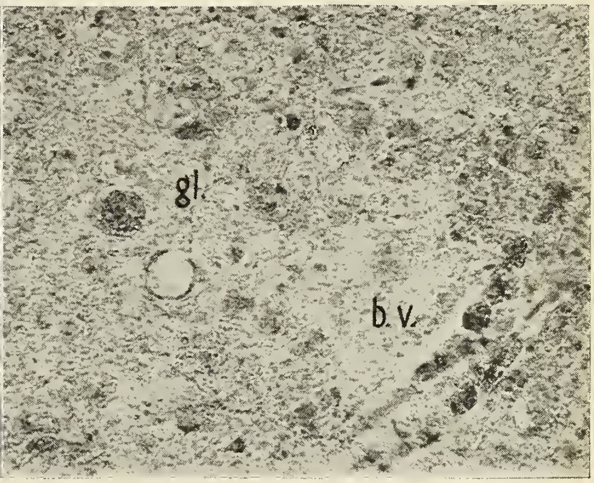


Fig. 14. White matter of frontal region. Sudan III stain for fat. gl.—protoplasmic glial cell filled with fatty granules. b.v.—blood vessel with a row of fat-filled scavenger cells in the perivascular space on either side of the vessel. X 300.

both arms, left more than right. Definite rigidity in the left leg. There was an area of decreased sensation to sharp and dull over the left tibia and dorsum of the foot. Lumbar puncture revealed a high cell count. There was a gold sol reaction in the first zone. Complete recovery by October 3. November 1 he again had fever, was unconscious and was taken to a hospital in Baden Baden, where a presumptive diagnosis of brain tumor was made, but because of the lack of a definite localization, no operation was undertaken. He was in coma for three days and died November 4, 1924.

No. 9, Gagel,[17] 1927. A boy eight years of age. After an attack of measles he developed a decrease of his mental faculties, was uninhibited and had a spastic paretic gait. The condition grew gradually but steadily worse. His intelligence decreased so that calculation, writing and reading became impossible. About three-quarters of a year after the onset there were high grade spastic phenomena in all four extremities. In about one year the patient stopped speaking. He did not react to external stimuli but only waved his arms here and there in an athetotic fashion. He then developed great difficulty in swallowing and died one and a quarter years after the onset, with pneumonia. His previous history had been essentially negative.

No. 10. Foix and Marie,[7] 1927. Patient, aged 63, had a spasmodic clubfoot since infancy. This condition appeared with convulsions at the age of a few months, after which the deformation of the right foot appeared. The foot at the time of examination was in the varus equinus position. There was a limitation of movement in dorsiflexion of the foot, although strength in the anterior leg group of muscles appeared normal. There was a considerable muscular atrophy, more marked in the extensors of the legs. Knee jerks active; the Achilles reflex could not be elicited, probably because of the contracture. Babinski sign positive. Anatomically there was found an era of centro-lobar localized sclerosis at the upper part of the left cerebrum. This sclerosis ramified throughout the considerable part of the left cerebral hemisphere's white matter. Microscopically it consisted of adult neuroglia tissue and Foix and Marie are inclined to interpret the condition as an encephalitis periaxialis diffuse which has come to a standstill.

No. 11. Liebers,[8] 1928, has summarized the clinical history of a patient, previously described by Merzbacher under the name of aplasia axialis extracorticalis congenita. The case was that of a girl who came from a remarkable family in that all told it included fourteen known cases of the disease. In the case of the patient in question the disease began in the third or fourth month of life with shaking of the head and eyes. Then there appeared gradually increasing spastic contractures of both the upper and lower extremities with positive Babinski and a fixed expression to the face, nystagmus, scanning speech, tremor and choreo-athetoid movements. Because of the increasing contractures and an osteoporotic involvement of the skeleton with deformities of the thighs, the patient finally became permanently bedridden. There were no sensory disturbances. The intelligence was only slightly involved. Death came from an intercurrent pulmonary involvement. While Liebers keeps this case separate from the other cases of diffuse cerebral sclerosis and designates it as the Pelizaeus-Merzbacher disease, it seems to me more likely that the condition is simply one in which the heredo-familial factor stands out extremely prominently. The pathology conforms fairly well to that described for the other cases of Schilder's disease.

No. 12. Bielschowsky and Henneberg,[10] 1928. Case 1. The birth and early development of the patient, a boy, were normal. Without recognizable cause he became ill at the end of his eighth year of life, with decreased hearing and spasms in the legs. The course of the disease was rapidly progressive. After two months a high grade decrease of vision already existed due to optic atrophy, and there were also severe spasms in the lower extremities. The reflexes were bilaterally spastic, more marked on the right side than on the left. After two months more there was blindness and severe loss of hearing. It seemed, however, that there was greater difficulty in the understanding of words than actual decrease of auditory acuity. Then rapidly appearing dementia occurred and the patient stopped playing, he cried incessantly, was incontinent, and ceased speaking. He also deteriorated markedly from a physical standpoint. Eleven months after the onset he was in a terminal state and there were severe spasms of the arms and legs, fixed pupils, optic atrophy, loss of the corneal reflexes. Spasms were more pronounced during spells of crying. Blood and the spinal fluid were normal. Death occurred in a cachectic state after a period of illness of not quite one year.

No. 13. Bielschowsky and Henneberg,[10] 1928. Case 2. The patient was the brother of the former patient. Normal birth. As a small child had attacks of laryngospasm and also temper tantrums, "Wegbleiben." Later there were pavor nocturnus and somnambulism. The disease began at ten and one-quarter years of age with decrease of hearing. Also in this case the auditory aphasia seemed considerably more marked than the decrease of hearing itself. Nine months after the onset there was disturbance of vision evidently due to optic atrophy. After one year spasms appeared in the lower extremities. At that time the mental condition was still good. Trepanation and inunction treatment had little effect on the course of the disease. One and a half years after the onset there appeared a series of epileptic attacks followed by a condition of unrest and confusion. During the months just previous to death the following symptom-complex appeared: blindness with advanced optic atrophy, complete deafness, extensive feeblemindedness, spastic paresis in the extremities, athetoid movements of the arms, increase of reflexes (though there was at the same time absence of the left knee jerk and decrease of the lower abdominal reflexes), periodic attacks of crying and laughing. Death occurred at the age of twelve and three-fourths years in a cachectic state.

No. 14. Sheldon, Doyle, and Kernohan,[18] 1929. Case 1. A boy aged 7, was admitted to the Mayo Clinic June 6, 1926. Ten weeks previously the parents had observed that the child was growing deaf and becoming somewhat apathetic. Six weeks previously it had been noted that his eyes no longer converged and that he stumbled and seemed clumsy. Three days before admission he fell to the floor. He rose only to fall again in a similar manner. The legs began to twitch and the arms and face were successively involved, while the eyes turned upward and to the left. Convulsions were controlled by ether. On regaining consciousness after the anesthetic he was blind and complained of frontal headaches which persisted for twelve hours. The following day he had another convulsion and then vomited about twelve times during the next twelve or fifteen hours. The vision and general condition then improved rapidly. On examination he was found to be partially deaf, but he also failed to understand much of what was said to him when he could hear. He could read moderately large print. Perimetric examination could not be performed. Fundus negative. Neurologic examination showed slight vertical nystagmus when the patient looked to the left. Convergence absent. The pupils were dilated and reacted to light and accommodation. There was suggestion of partial paralysis of the lower portion of the right half of the face with associated movements of the fingers and toes on the left side. The right patellar and Achilles reflexes were somewhat exaggerated and Babinski's sign was present bilaterally. The abdominal reflexes were not obtained. Vibration sense was lost over both malleoli. There was incoördination on the finger-to-finger and heel-to-knee test, particularly on the left side. The gait was somewhat ataxic and slightly spastic. Spinal fluid negative except for a curve in the colloidal benzoin test in the middle zone. *X*-ray studies, urinalysis, blood counts, Wassermann reaction and urea content of the blood were all negative. The patient had a suppurative otitis media on the right side which cleared up under treatment. Condition was unchanged until July 12, when he vomited several times on arising, complained of severe headache and expressed fear of dying. He then had a slight general convulsion, was stupid and confused afterward and occasionally cried out as in pain. Several attacks followed in the course of the next few hours. Was taken to a hospital, where he appeared dull and exhausted though he tossed about restlessly He soon became noisy and violently resistive, thinking he was being poisoned. Consciousness was partly regained the following morning. He was blind at that time. During the day he became more rational and the vision improved. July 16 preservation of speech was noted. He was more emotional. He was totally deaf and continued having convulsions. Ventriculography was performed July 30 and it was noted that the subcortical cerebral substance was resistant to the passage of the cannula. Grew steadily worse; by September 15 he was unable to walk; control of the arms and legs was gradually lost and about October 10 he became unable to speak. Early in November he had difficulty in chewing and in moving the tongue. Subsequently dysphagia developed. He died November 26, 1926.

No. 15. Sheldon, Doyle and Kernohan. Case 2. "A woman aged 27 was admitted to the Mayo Clinic June 29, 1927, complaining of blindness. She had always been well and strong. Six and a half weeks previously she had been delivered of her first child by forceps. Two days later, a foul vaginal discharge was noted, and fever and malaise set in and persisted for three weeks. Four weeks before admission the patient had noted slight blurring of vision which progressed to complete blindness in the course of a week. Subsequently her general condition improved considerably."

Examination showed complete blindness, dilated pupils, slight optic neuritis, partial paralysis of the lower part of the left half of the face. The laboratory tests were negative. By July 2, the patient became slightly stuporous and complained of nausea. She had a generalized tremor, the facial paralysis was more marked, the tendon reflexes were increased on the left side and she was involuntary. By July 5 she had a complete left-sided hemiplegia and was in coma. The spinal fluid pressure was 300 mm. of water. Cerebral abscess was suspected. She was operated upon July 5 and died July 9.

The gross pathology of this case does not conform to the ordinary picture of "Schilder's Disease" and certain features of the microscopic pathology are atypical.

THE CLINICAL AND PATHOLOGIC PICTURE

Schilder has summarized his investigation of 1912 as follows:

"1. First, there is a diffuse disease of the white matter of the cerebral hemispheres, occurring in childhood, which one is justified in considering as a separate disease on the basis of a characteristic macroscopic and microscopic pathology. I propose the name encephalitis periaxialis diffusa for this disease."

"2. The clinical picture of the disease is a very inconstant one. It occurs now under the picture of a brain tumor, and again under the picture of multiple sclerosis, and further under the picture of diffuse sclerosis of the type Heubner. One will naturally suspect the existence of the disease if the symptoms indicate an extensive lesion of both hemispheres. Rapidly developing cases of the symptomatology of multiple sclerosis at an early age of the patient will likewise suggest the possibility of this disease. The disease is fatal and the course has only a slight tendency to remission."

"3. Encephalitis periaxialis diffusa stands closely in relationship pathogenetically to multiple sclerosis, and especially closely to the acute forms of multiple sclerosis. Also for this disease there must be assumed a toxic effect on the brain. It has no relationship whatsoever to pseudosclerosis, tuberous sclerosis or to a certain number of the cases of so-called diffuse sclerosis."

"4. The etiology is still unexplained. Probably endogenous factors favor the development of the disease. The morphological findings do not support the assumption of an abnormal embryologic development of the brain."

Globus and Strauss[6] described the clinical group as follows:

"Thus an abrupt onset, a rapidly progressive course, characterized by mental deterioration, rapidly advancing spastic paralysis, epileptiform attacks, features of decerebrate rigidity, ocular palsies and other ocular manifestations such as nystagmus, optic atrophy, and blindness without optic atrophy followed by a rapid decline with fatal issue (within two years) are fairly typical."

Collier and Greenfield[4] have outlined the clinical aspects of the condition as follows:

> "A malady usually occurring in children and young subjects with no tangible causal factors or antecedent experience. The onset is a few days, the course progressive and some remission to a fatal issue, the duration from a few months to three years. The chief early sign is cerebral blindness which becomes complete, to which is added mental reduction and increasing spastic paralysis. Unsteadiness from parietal involvement and deafness from temporal involvement may be conspicuous. The amentia increases and passes into coma, which terminates the illness. The condition, usually bilateral, may commence on one side or may be confined to one side."

As Bouman's[3] observations and literature citations show, the foregoing statements of the clinical syndrome are inadequate in that so many other symptoms may appear that one is left with no very satisfying concept of the clinical picture of the disease. For instance headache, vomiting, incontinence and fatigue were found in the majority of the cases that Bouman reviewed. Epileptiform attacks were common. A few of the cases showed choked disk. Tonic and clonic convulsions occurred in several of the cases. Pupillary anomalies occurred. There was Argyle-Robertson sign in one. Strabismus, diplopia, disturbances of the conjugate movements were common. Transitory paralyses were noted. The tongue was commonly partially paralyzed. Intention tremor occurred. Then, too, while most of the patients are young, the condition is by no means limited to infancy or childhood.

Cases such as that reported by Bielschowsky[2] and reviewed in the present paper as No. 2 in the series reported from the literature, do not fit into the clinical picture at all as it is usually conceived.

It is evident in reviewing the literature of the condition that a clinical diagnosis of diffuse cerebral sclerosis can be made only in a certain percentage of the cases. The condition will frequently be confused with brain tumor, with multiple sclerosis and possibly with syphilis and arteriosclerosis.

Pathologically the findings in most of the reported cases conform reasonably well with those in the present material. However, the pathology of the condition as described by various writers is not always uniform. Sheldon, Doyle, and Kernohan's[18] case 2, Foix and Marie's[7] case and others show this lack of conformity. Of course, no two cases are absolutely identical, but in general, subcortical diffuse demyelinization with astrocytic glial overgrowth in the region, secondary degeneration of the pyramidal tracts and more or less preservation of the subcortical arcuate fibers are the principal pathologic characteristics of the condition.

NOSOLOGICAL CONSIDERATIONS

Several attempts have been made by various writers to properly classify the various conditions grouped together under the term diffuse sclerosis. Neubürger has proposed the following subgroups under diffuse cerebral sclerosis: First, a blastomatous or neoplastic; second, an exogenous inflammatory; and third, an endogeneous degenerative. As Bielschowsky and Henneberg have stated, however, the blastomatous group is a very weak one nosologically. While it is conceivable that a glioma might infiltrate a very large portion of both hemispheres of the brain, it is unlikely that such a tumor would limit itself to the white matter alone, producing degeneration of the myelin sheaths with relative preservation of the nerve fiber processes themselves, however, and then evidence itself as a sclerotic process, as scar formation, instead of showing the many types of young glial cells which one usually sees in a glioma. In other words those cases of so-called diffuse sclerosis which have been considered neoplastic are to be looked upon with a good deal of suspicion as being probably not neoplastic.

Schilder's term encephalitis periaxialis diffusa implies an inflammatory basis for the condition. His original case is in itself not at all conclusive either in the clinical course or in the pathological findings of an inflammatory condition. Probably the most outstanding case in the literature which could be classified as inflammatory diffuse cerebral sclerosis is the one reviewed in the present paper as reported by Bielschowsky. But even here, though the clinical findings are extremely suggestive, the pathological picture is by no means conclusive of an inflammatory process. Of the so-called inflammatory cases, while admitting the possibility of such a group, there is a dearth of good illustrative material and we are totally in the dark regarding any satisfactory designation of the etiologic factors which may underlie the inflammatory production of the diffuse sclerosis in any one case.

To state that a condition is endogenous and degenerative is applying a name to it which does not carry much force unless we can indicate the factors, endogenous or degenerative, which produce the condition. The only obvious endogenous factor which has been satisfactorily pointed out in the literature of this condition is the hereditary factor. The case presented in the present article is probably a member of this group. Bielschowsky and Henneberg have reported hereditary cases. Ferraro, Krabbe and others have also given us examples belonging to this group.

Though one may have difficulties in a given case in the clinical differentiation of diffuse sclerosis from multiple sclerosis, with the rare cortical sclerosis such as has been reported by Rusk and Nixon,[19] with tumors and probably with certain other conditions, the clinical and pathologic picture as a whole is sufficiently definite to permit its separation from other sclerosing entities. In the light of what has been stated in the foregoing it seems to me that a simple terminology is still usable. The terminology should be on a descriptive basis because of our lack of knowledge of the etiologic factors except heredity.

A simple classification follows.

In order to designate the group of conditions falling under the general heading one might use the term *Diffuse Subcortical Sclerosis.* "Subcortical" is more accurately descriptive than "cerebral."

Under *diffuse subcortical sclerosis* then one could place three general types: 1. *Inflammatory type.* 2. *Hereditary* or *familial type.* 3. *Primary* or *essential* or *non-hereditary* or *sporadic type.*

1. The *inflammatory type* would include such rare cases as Bielschowsky's.[2] In those cases where the inflammation is due to a well-known etiologic inflammatory entity, the diagnosis of diffuse subcortical sclerosis should not be used, but the diagnosis should be that of the primary inflammatory condition.

2. The *hereditary* or *familial type* would include such cases as that reported in this paper, Bielschowsky and Henneberg's, Scholz's, Krabbe's cases and those of the so-called Pelizaeus-Merzbacher disease. Bielschowsky and Henneberg suggest the subdivision of this group into an *acute infantile* (Krabbe), a *subacute juvenile* (Scholz), and a *chronic type* (Pelizaeus-Merzbacher). In the light of the small number of cases and the lack of good definition between these forms it seems to me unnecessarily complicated to make these distinctions.

3. The *primary* or *essential* or *non-hereditary type* would include those cases of diffuse cerebral sclerosis identical with those of the *hereditary* or *familial type* but lacking the hereditary factor. The occurrence of sporadic cases of hereditary diseases is a common observation in any larger medical clinic. No doubt, therefore, many cases that might naturally be placed in this category really belong with the *hereditary* or *familial* type. Possibly, if our knowledge of family histories were complete, we would be in a position to do away with the *primary* type altogether.

SUMMARY

1. A case of diffuse subcortical sclerosis of the familial type is presented clinically and pathologically.

2. The case reports from the recent literature of this and allied conditions are summarized.

3. The confusion of classification and terminology is **pointed out.**

4. A simple classification is suggested as follows:

(a) The term *diffuse subcortical sclerosis* is a satisfactory designation for the general group. The subgroups are:

I. Inflammatory type.
II. Familial—hereditary type.
III. Primary or sporadic type.

126 Millard Hall
University of Minnesota
Minneapolis, Minnesota

BIBLIOGRAPHY

1. Schilder, P.: Zur Kenntnis der sogenannten diffusen Sklerose. (Über Encephalitis periaxialis diffusa), Ztschr. f. d. ges. Neur. Psychiat. 10:1, 1912.
2. Bielschowsky, F.: Die Bedeutung des Infektes für die diffuse Sklerose. Jour. f. Psychol. Neurol., 33:12, 1927.
3. Bouman, L.: Encephalitis periaxialis diffusa. Brain, 47:453, 1924.
4. Collier, J., and Greenfield, J. G.: The encephalitis periaxialis of Schilder. A clinical and pathological study, with an account of two cases, one of which was diagnosed during life. Brain, 47:489, 1924.
5. Ferraro, A.: Familial form of encephalitis periaxialis diffusa. Jour. Nerv. and Ment. Dis., 66:329 479 and 616, 1927.

6. Globus, J. H. and Strauss, I.: Progressive degenerative subcortical encephalopathy. Arch. Neurol. and Psychiat., 20:1190, 1928.
7. Foix, C., and Marie, J.: La sclérose cérébrale centro-lobaire a tendance symétrique et l'encéphalite péri-axiale diffuse. Presse méd., p. 417 (Apr. 2), 1927.
8. Liebers, M.: Zur Histopathologie des sweiten Falles von Pelizaeus-Merzbacherscher Krankheit. Ztschr. f. d. ges. Neur. Psychiat., 115:487, 1928.
9. Krabbe, K.: A new familial infantile form of diffuse brain sclerosis. Brain, 39:74, 1916.
10. Bielschowsky, M., and Henneberg, R.: Über familiäre diffuse Sklerose (Leukodystrophia cerebri progressiva hereditaria). Jour. f. Psychol. u. Neurol., 36:131, 1928.
11. Stewart, T. G., Greenfield, J. G., and Blandy, M. A.: Encephalitis periaxialis diffusa. Report of three cases with pathological examinations. Brain, 50:1, 1927.
12. Schilder, P.: Die Encephalitis periaxialis diffusa (nebst Bemerkungen über die Apraxie des Lidschlusses). Arch. f. Psychiat., 71:327, 1924.
13. Scholz, W.: Klinische, pathologisch-anatomische und erbbiologische Untersuchungen bei familiärer, diffuser Hirnsklerose im Kindesalter (Ein Beitrag zur Lehre von den Heredodegenerationen. Ztschr. f. d. ges. Neur. Psychiat., 99:651, 1925.
14. Kraus, W. M., and Weil, A.: An unusual and protracted case of Schilder's disease. Arch. Neurol. and Psychiat., 15:135, 1926.
15. Kraus, W. M., and Weil, A.: Encéphalite périaxile diffuse (Type Schilder), L'encéphale, 23:49, 1928.
16. Schaltenbrand, G.: Encephalitis periaxialis diffusa (Schilder). Arch. Neurol. and Psychiat., 18:944, 1927.
17. Gagel, O.: Zur Frage der diffusen Sklerose. Ztschr. f. d. ges. Neur. Psychiat., 109:418, 1927.
18. Sheldon, W. D., Doyle, J. B., and Kernohan, J. W.: Encephalitis periaxialis diffusa. Arch. Neurol. and Psychiat., 21:1270, 1929.
19. Rusk, G. Y., and Nixon, C. E.: Diffuse cortical sclerosis. A clinical and pathologic report of two cases. Jour. Lab. and Clin. M., 12:644, 1927.

LOCALIZED ACTINOMYCOSIS*

H. B. Zimmermann, M.D., F.A.C.S.
Miller Clinic
St. Paul

IN 1875 Cohn described a filamentous organism obtained from a lacrimal duct abscess, which he called a streptothrix. Bollinger in 1877, in collaboration with Hartz, the botanist, described a new fungous disease of cattle. Because of the ray-like arrangement of mycelial threads of the fungus, they called the condition actinomycosis.

Israel in 1878 reported from the Jewish Hospital in Berlin three cases of a chronic, localized, pyogenic disease in human beings. He gave an excellent description of the pathologic process and what he took to be the causative agent, a mycotic fungus with micrococcus-like bodies. These micrococci, he said, were either forms of the fungous growth or organisms which grew symbiotically with the fungus. Cohn was permitted to study Israel's organism and he identified it as the same as that described by him three years before.

Eppinger in 1890 studying the cultural characteristics of the ray-fungus, attempted to find evidence of the production of a soluble endotoxin, but with negative results. Harbitz and Grondahl, in 1911, studied eighty-seven cases of actinomycosis giving special attention to the source and mode of infection. They found many types of actinomyces occurring in nature, but none resembling those recovered from the lesions in man, a specific anaërobic actinomycete (actinomyces hominus). Wright, Shiata and others came to the same conclusions.

The occurrence of five cases of localized actinomycosis in my own practice in two years suggested this presentation. In most of my cases the patient had to do with the handling of cattle, and two gave definite histories of the entrance of a piece of grass or barb of barley in the exact location where the lesion ultimately developed. It is quite possible that the infection is transferred from one infected animal to another through the contamination of grass or hay, the entrance of such a foreign body making an ideal anaërobic inoculation.

Actinomyces are found in nature and can easily be cultured from plants and grasses, or their spores recovered from the air. In every instance these organisms are found to be of the aërobic type, producing in their growth, aërial hyphæ, whereas the pathogenic type is constantly anaërobic and grows only beneath the surface of the medium. The pathogenic organism has been found only in its animal hosts, but the presence of bits of grass or hay in the lesions has been considered by many as conclusive evidence that these were the carriers of the infection.

The lesion of actinomycosis is a very constant one, the focus of infection always essentially a granuloma. Depending on the age and location of the granulomata, they vary in size from that of a pea to large irregular masses often connected with one another by fistulous tracts lined with the same tissue. The lesions contain very little fluid pus and almost no necrotic tissue. The amount of tumefaction about the lesions is dependent on their location. If situated in the neighborhood of fascial planes there will be an enormous amount of fibrous tissue converting the entire region into one homogeneous mass. On making a section through such an inflammatory area it will be found to be made up of the various types of tissue, such as muscle, fibrous tissue, and, when in that location, salivary gland. The infiltration with new-formed fibrous tissue is of such uniform hardness that the normal cleavage planes are entirely obliterated. Somewhere within this mass will be found one or more granulomatous masses made up of soft, red, pulpy granulation tissue, and, if there is no secondary infection, only a slight amount of pus. If one searches diligently an occasional sulphur granule will be found.

Obviously the symptoms vary according to the location of the lesion. Patients ordinarily suffer very little from the presence of such an inflammatory process. In lesions about the face or neck there may be neuralgic pain from involvement of the sensory nerves, or stiffness of the neck or trismus if the muscles of mastication are involved. Variation from the normal blood-picture depends entirely on the presence or absence of secondary infection.

---

*Presented before the Western Surgical Society, Del Monte, California, December 13, 1929.

The most frequent type of infection is the cervico-facial form. In the typical advanced case of this type of infection the inflammatory mass extends from the parotid region into the submaxillary triangle. The swelling of the neck often extends beyond the line of the jaw, the skin being shiny, purplish in color, and the entire involved tissue of wooden hardness. There may be superficial, fluctuating areas or depressed fistulous openings, and often scars from previous incisions. In lesions as extensive as this there is regularly trimus from involvement of the muscles of mastication.

In regard to the diagnosis of actinomycosis, it may be said that any indolent, chronic, indurative, inflammatory process should be under suspicion, but the only positive diagnostic finding is the discovery of the ray-fungus in the sulphur granule. These sulphur granules are not as common as one might expect, and we have seen cases that were treated as being actinomycosis, with a moral certainty that the diagnosis was correct, in which sulphur bodies were never found. In one instance, the first time the patient was seen a sulphur granule was expressed from the fistulous opening, and although the entire mass was radically excised and submitted to careful examination, additional ones were not discovered. Unfortunately, although these organisms can be grown *in vitro*, it is almost impossible to grow them from the tissue or any other material than the sulphur granule itself. Therefore, cultures are of no value, since, if the granule is found, the diagnosis can be made immediately by microscopic examination of the unstained material. To make the microscopic diagnosis one must be able to demonstrate the ray-like arrangement of the club-shaped bodies, for other large organisms, notably Vincent's, tend to form yellowish clumps. The long fusiform bacteria can easily be confused with the mycelial threads of the ray-fungus, especially if one is prejudiced.

The treatment of actinomycosis should be a definite and very radical procedure, and the clinical and pathological pictures are quite constant. Even if the fungus cannot be found, I believe that in such an instance it is justifiable to make a clinical, unsubstantiated diagnosis and operate accordingly.

In discussing the treatment of this condition I have in mind the cervico-facial, cellulitis type of lesion, chiefly because this form lends itself to surgical treatment. The actinomycete is strictly anaërobic and not vigorously pathogenic, and if a single granuloma is given a thorough communication with the air, I believe it will be destroyed by this procedure alone. It is next to impossible to locate these areas in the large masses of indurated tissue, and, unlike collections of pus that lie in fascial spaces with normal cleavage planes leading to them, the actinomycotic granuloma is in a solid mass. The only certain method of eradicating it is the radical excision of the entire involved area in one or more stages. I have always made this excision with a knife, but I believe the next one I have to do I will try the high frequency knife to obviate the bleeding. The area to be excised should be marked out in the neck and the incision so planned to avoid, if possible, the branches of the facial nerve. The wound should be funnel-shaped to an exaggerated degree. The bleeding can be best controlled by packing, as one goes along, with absorbent cotton. If the indurated tissue extends behind the mandible this too should be excised. It is better to get beyond the tumor in one part and leave the remainder for later stages, than to do the entire operation in a perfunctory manner. After the excision, if the bleeding is severe, packing with dry cotton for a short time will usually control it. After the excision has been made I have packed the wound with equal parts of Lugol's solution and glycerin. This packing should be changed every other day. If the wound has been properly made and there are no undercuts nor crypts, this packing will come out quite easily and without pain, but the process of inserting the iodin packing is frightfully painful. The pain can be avoided by first packing the wound lightly with cotton soaked in 5 per cent cocain solution. This should be left in for five to ten minutes. The wound can then be packed with iodin gauze. (I use cocain this way very often in doing painful dressings and exploring fresh traumatic wounds and have never seen any constitutional effects from it, although I would hesitate to use the same solution on mucous surfaces.)

If in a week or ten days after such an operation, a portion of the wound has failed to show a sufficient degree of resolution, radical excision should be performed.

I am not sure that potassium iodid given internally has any value. We have given it in increasing doses to all our patients, but favorable results followed only in conjunction with surgical procedures.

We have tried *x*-ray and radium, but I will admit that the cases in which we tried them were not fair tests of the treatment.

REPORT OF CASES

Case. 1—Mr. A. K., a rancher, thirty-two years of age, entered the Miller Hospital on January 26, 1929, with complaint of a discharging sinus in the left side of the neck and jaw. The present illness had begun five months previous to hospital entrance, when the patient got a foxtail grass under his tongue. About ten days later a small lump appeared in the left side of his jaw. At the end of three weeks it was lanced, only a very small amount of pus being obtained. The wound was packed with iodoform gauze until it closed. It again increased in size and six weeks later was reopened. It healed the second time. The induration increased and shortly before admission to the hospital it broke down and discharged of its own accord.

Past history was negative and the family history was not pertinent to the patient's condition. Social history brought out the fact that he had looked after stock all his life, but there was no history of actinomycosis in his cattle in recent years.

Physical examination was negative except for chronically infected and hypertrophied tonsils and the essential pathology, which was a mass on the left side of his neck extending from the parotid region to the midline and filling the anterior cervical triangle. There was an opening in the most prominent part of the tumor, which exuded considerable pus, and scars from previous operations were evident.

The blood and urine were normal.

The day after admission a complete excision of the mass in the anterior cervical triangle was made under ether anesthesia. The wound was packed with gauze soaked in 50 per cent Lugol's solution and glycerin. This was changed frequently, the wound first being cocainized before insertion of the iodin gauze.

Twenty days after operation the wound had almost healed, and a tonsillectomy was performed under local anesthesia, without complications.

Patient was discharged thirty days after admission and has been subsequently reported as well.

Case 2.—Mr. R. R., railroad executive, forty-two years of age.

The patient rode horseback but had nothing to do with the care of animals nor with cattle. Three months before admission, while driving in the country, he stopped at a farm house and while walking through a lane picked an ear of grain and held it in his mouth. One of the barbs from the grain stuck in the posterior part of his tongue. He made several futile attempts to remove it and was still conscious of its presence the next morning, when he consulted a nose and throat specialist, who was unable to remove the foreign body. When I saw him, approximately three months later, he had a tumor of the tongue just anterior to the lingual tonsil. Incision was made into it and with a curette some soft, red, friable tissue was removed. There was one small mass of pus which contained a typical sulphur granule in which the ray-fungus was identified. The incision over the mass was enlarged so that the wound was as large as the widest part of the granuloma. It was packed with gauze soaked in Lugol's solution and glycerin every day until it entirely healed. At the end of two weeks it had entirely healed and there has been no recurrence.

Case 3.—Miss F. K., a clerk, twenty-seven years of age, was admitted to the Miller Hospital on June 27, 1922, with a complaint of soreness and stiffness of the tongue and difficulty with speech. Present illness began five months previous to hospital entrance, when she noted that her tongue felt stiff and sore and ached a great deal. These symptoms would be aggravated by attacks of tonsillitis. Shortly before admission a tonsillectomy was done, but with only slight improvement. One week before entering the hospital a small, dark red spot resembling a blood blister appeared near the midline of the dorsum of the tongue about one inch from the tip. This spot persisted. She also complained of headache, nausea and frequent colds.

The family and social histories were essentially negative. Past history was negative except for frequent attacks of quinsy and sore throats since she was twelve years old.

Physical examination showed on the dorsum of the tongue a small fistulous opening directly in the midline, about which there was some induration resembling a cylindrical mass extending from the dorsum of the tongue to the region of the hyoid bone.

Under local anesthesia an elliptical incision was made on the dorsum of the tongue around the fistulous opening and the cavity exposed would admit a finger. This was filled with dark red granulations. It extended as far as the hyoid bone, apparently in the substance of the hyoglossus muscles. The cavity was thoroughly curetted and packed with iodin gauze.

The microscopic examination showed the curettings to consist of fibroblasts, lymphocytes and pus cells. There was one small round body surrounded by pus cells consisting of a mass of coiled, blue-stained filaments surrounded by a corona of radiating, red-stained clubs typical of the ray-fungus.

The patient was discharged as cured in four months and there has been no recurrence.

Case 4.—Mr. B. F. R., a live-stock commission merchant, thirty-five years of age, entered the hospital, complaining of a mass on the right side of the neck, stiffness in the neck and some pain.

Patient was a live-stock commission merchant at South Saint Paul and his work necessitated his being around stock and he was given to chewing hay. About one month previous to his admission a small mass appeared near the angle of the jaw. This gradually increased in size until it reached anteriorly almost to the midline. The patient's own diagnosis was that he had "lump jaw" and that it was caused by his habit of chewing hay. His past history was negative.

Physical examination was negative except for a firm, hard, slightly tender mass on the right side of the neck extending from the angle of the jaw toward the midline. Near the center of this mass was a small point of fluctuation.

At operation the mass was opened and a granulomatous cavity about the size of a hickory nut was found. Material from this mass showed the typical sulphur granule. The entire indurated area was then excised and packed with iodin gauze. The excised tissue showed one or two other granulomatous areas.

The wound healed entirely and his recovery was uneventful.

Case No. 5—Mr. O. M., a farmer, sixty-five years of age, entered the hospital on September 22, 1928, with a diagnosis of advanced actinomycosis in the cervico-facial region.

About three months previous to admission there was induration in the left submaxillary region. One month previous to admission patient developed pain and some dysphagia. His lower jaw began to swell, was hard and lumpy and very painful. This region was opened several times during the month before admission, but the process continued to extend.

In taking the family history it was learned that he had a son who died of a peculiar pneumonia that was preceded by a chronic abscess in the region of his jaw.

Physical examination showed an old man in fair health except for a hard, ulcerating, tender mass involving the entire parotid region and entire anterior angle of the neck. When pressure was exerted in the neighborhood of one of the fistulous tracts some pus with one sulphur granule was expressed. This was the only one we ever found.

The patient was operated on the day after admission and a fairly radical excision of the entire mass was made. The wound was packed with iodin-glycerin gauze. Two weeks later there was still a great deal of induration at the base of the wound and toward the angle of the jaw. A second operation was done, the excision being carried to the mandible, which was laid bare on its inferior and mesial aspects and the tissues excised toward the floor of the mouth. It was again packed with iodin gauze and hot, wet dressings were applied. This treatment was continued for a period of about thirty days, when he was allowed to go home under the same treatment.

A report from his family doctor indicated a gradual improvement and six months later his wound was entirely healed. Another six months showed no recurrence.

CONCLUSION

Actinomycosis is not rare. The fact that it is an anaërobic infection suggests its treatment. The sulphur granules are not numerous and may not be found. If this is the case, and the clinical picture is typical, the condition should be treated as though it were actinomycosis. The treatment should be radical excision and, if necessary, multiple operations until resolution of the induration is certain. Local treatment of the wound with iodin is probably of value. Frequent dressings with repacking of the wound is necessary to provide an unfavorable anaërobic situation.

BIBLIOGRAPHY

Abbot & Gildersleeve: Ibid., 547.

Abbott: Jour. A. M. A., 82:1414-15, May 3, 1924.

Bostroen: Ziegler's Beit., 1891, ix, 1.

Christison & Warwick: Jour. A. M. A., Vol. 89, Sept. 24, 1927, pp. 1043-6.

Dresel: Ziegler's Beit., 1915, lx, 185.

Harbitz & Grondahl: Am. Jour. Med. Science, Sept., 1911, cxlii, 386.

Harris: Jour. Cut. Dis., Vol. 34, August 1916.

Hunermann: Deutsche Medizinische Wochenschr., 53:801-2, May 6, 1927.

Israel: Virch. Arch., 1879, lxxiv, 15; xxviii, 421.

Judd: Brit. Med. Jour., 3436:886-887, November 13, 1926.

Kohler: Frankfurter Zeit. f. Path., 1914, xv, 146.

MacCallum: Centralbl. f. Bakt v. Paras. Abth. 1, orig. 1902, xxxi, 529.

MacCallum: Text Book of Pathology.

Ponfick: Die Actinomykose d. Menchen, Berlin, 1882.

Rispal et Serr: Toulouse Med., 6:224-235, October 15, 1904.

Rolleston: Proc. Roy. Soc. Med., London, 6: Clinic Sect. 83, 1912-13.

Schlapper: Münchener Medizinische Wchnschr., 72:1034, June 19, 1925.

Shiata: Dtsh. Zeit. f. Chir., 1909, a, 289.

Snoke: Amer. Jour. Med. Sci., 175:69-78, January 1928.

Woo & Young: The Clinic Med. Jour., 40:461-463, May 1926.

Wright: Jour. Med. Research, 1905, xiii, 349.

DISCUSSION

Dr. James F. Percy (Los Angeles, Calif.): I would like to say a word in reference to the treatment of this condition. Dr. Zimmermann spoke of the high frequency on cures. If he will use the cautery he will not only clear up the cases very quickly, but he will have no pain and no hemorrhage. The high frequency will leave a sore or a surface that does not heal well, and it has practically no effect on the fungus growth.

I have a rule that can be followed in these infections, just as I followed it in cancer, in using the cautery: All tissues normally movable fixed by the pathology make normally movable again with the heat. This rule applied in this situation will clear up these cases very quickly.

Dr. W. M. Mills (Topeka, Kans.): I would like to ask if the Doctor places any value on the sustoxin treatment, or the iodid treatment.

In connection with Dr. Percy's statement, I had one case of actinomycosis of the palate, which was treated extensively by radium, with no results whatever. So I used a cautery and got prompt results. The infection was entirely healed in three weeks.

Dr. W. B. Holden (Portland, Ore.): I was wondering if anyone had used thymol in the treatment of actinomycosis, as brought out by Dr. Myers, at the University of Oregon. He has published somewhere—I can't tell you where—some very remarkable results in the use of thymol internally and locally in the treatment of actinomycosis.

Dr. A. L. Blesh (Oklahoma City, Okla.): I will say that my first experience with actinomycosis occurred when I was a boy on the farm, in the disease known as "lumpy jaw" in cattle. The cautery was extensively used in those cases by the farmers themselves and veterinaries, without curing the cases as they occurred in the animals.

My own experience in the treatment of actinomycosis has not been extremely satisfactory. I have treated most of my cases with iodin in some form or other.

One particular case I recall I had a great deal of trouble with. I sent the patient to Rochester, and they sent him back without operating. So I really am gratified to know that Dr. Zimmermann has been sucessful and I shall try to take some lesson home with me on that score. I observe, in his discussion of the treatment, that in some of the cases he has merely corrected the condition, and then packed it with Lugol's solution. I wonder if he reached all the germs or all the infection by his operation or whether in this instance he intended the solution to cure the condition. I would like to have him bring that out.

Dr. F. E. Clough (San Bernardino, Calif.): I would like to ask one question relative to the use of copper sulphate internally and externally: Is it extensively used?

Dr. Rowland H. Harris (Battle Creek, Mich.): I want to report two cases of actinomycosis that I have had: One was the case of actinomycosis of the tongue, occurring at the tip of the tongue, a mass about the size of a hickory nut. I made a clean incision and suture of the tongue and cleared out the granuloma under the jaw. The man is still alive, after five years, with no signs of any recurrence. I did nothing but the excision.

The other case is a woman upon whom I operated about twelve years ago for the removal of her appendix. I did not get the diagnosis then of actinomycosis. Several years later I operated again and removed the right ovary. I removed a mass the size of a goose egg that was actinomycosis. Two or three years later she developed actinomycosis on the left side, probably from some left over from the right side, and an abscess formed in the groin. She was given large doses of potassium iodid. She is still alive and quite well.

Dr. Gatewood (Chicago, Ill.): I left two cases of actinomycosis when I left Chicago, and I expect a third one when I get back. One of them was a gas case; one was an ileocecal type, either involving the subphrenic region or the abdominal wall.

A word about diagnosis. Dr. Zimmermann has brought out the fact that the clinical picture is characteristic. It is so characteristic that one can make a diagnosis in spite of the laboratory findings. The best laboratory method we have found is biopsy. When repeated microscopic sections and cultures fail, biopsy of some of the granulated tissue will show the fungus in the tissue.

In regard to the use of copper sulphate, Dr. Zimmermann will answer that from his experience, but I can say a few words about it from our experience. The injection of copper sulphate makes a great many people sick, and I have been very doubtful as to its effect. I think potassium iodid possibly does more good internally, in the way of local application. Whether it is of benefit or not depends upon the kind of glasses the man wears: If they are blue, it cures them; if they are plain, it doesn't.

There is one other thing in the way of treatment that has not been mentioned, which I cannot pass by, because Monterey has the credit of curing at least one case: A patient who had been operated upon a number of times went from 160 pounds down to 90 pounds, and was given up as a hopeless proposition, the lesions being too extensive for a radical operation. That patient came here to Monterey and, living out-of-doors with nothing on, returned to Wisconsin at the end of two years' time, having regained her normal weight, without any other treatment.

Dr. Zimmermann (closing): With regard to the general treatment: We have used potassium iodid in all of our cases, but have not had favorable results. We have one Chinese patient with pulmonary actinomycosis who has had it for a year, and he has been spitting up sulphur granules and a great deal of pus. He had everything, but I blame the potassium iodid. He apparently is slightly improved but he still has x-ray evidences of a rather extensive lesion. He is not spitting any more of the granules and his sputum is a little bit less. I am sure that he will die of actinomycosis, although apparently he is somewhat improved.

With regard to thymol: I haven't tried it, but the reports do not look very convincing. Copper sulphate was tried some years ago; my partner tried it in one or two cases and got no results. Also, the literature on that was not very convincing.

I feel about actinomycosis as I do about cancer—nothing can be done by surgery that is half as bad as what they will do themselves eventually.

A wide incision, leaving the wound widely open, dressing frequently, and keeping it exposed is, I think, the crux of the treatment.

In regard to the suggestion that the cautery might cure actinomycosis because it has been tried on animals: I had an interesting experience in trying to work out the bacteriology of this thing. I sent to the stockyards for actinomycotic jaws of cattle. I got several specimens that were condemned as being actinomycotic. None were. They were specimens of lymphadenitis in the region of the jaw. I think the farmers who are around cattle are inclined to call any lump about the jaw actinomycosis. Lymphadenitis does occur in cattle.

Of course, with regard to the dissection of lymph nodes—it is not a question of lymph node dissection, it is a question of a wide excision of a large iflammatory area. The actinomycosis does not extend to the lymph channels, but it grows in the tissues and makes these granulomatous areas.

CASE REPORTS

BILATERAL SPONTANEOUS PNEUMOTHORAX

REPORT OF CASE

John G. Lamont, M.D.
Nopeming, Minnesota

This condition has been described as a fatal complication in pulmonary tuberculosis by Meyer, Marshak, E. A. Gray, Bourne, Greshey, LeWald, Elte, Benedict and Donahue.

Emmerson and Boeler and also Benedict report the complication as a cause of death in asthma. Briggs cites a similar result in a metal worker in whom autopsy revealed gastric carcinoma without evident metastasis to lung tissue.

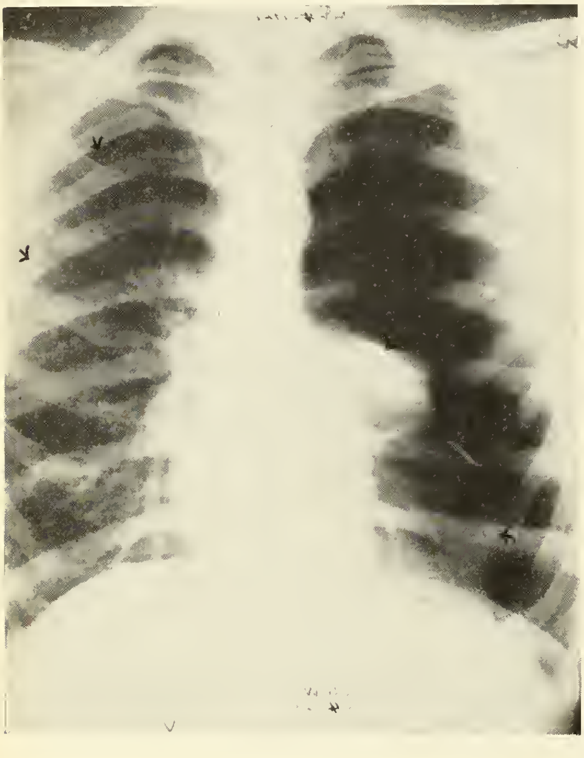


Fig. 1. October 4 (day following collapse). Lung margins right and left are indicated by arrows. Left upper lobe forms a dense shadow close to mediastinum.

Recovery has been reported in only five cases, exclusive of the present instance. Hawes, Jr., Gershey and Hazen each cite recovery from the complication in pulmonary tuberculosis, Eberts in a bilateral pyopneumothorax, and Bedford and Joules a complete recovery after fourteen days, in a patient otherwise healthy. In all patients who have recovered, some form of pleural deflation was used.

CASE REPORT

On October 3, 1927, W. L., a young North Dakota farmer, was employed in pumping water with a double-cylinder hand-pump, into a water tank used to supply a steam threshing engine. Each tank filling involved a half hour of hurried labor. When the tank was almost filled, he was seized with pain in the left side of the chest, severe dyspnea and faintness. He reclined upon the top of the tank, and shortly, finding breathing less difficult, reached for the reins, and while still lying down, succeeded in driving his team and tank to the machines about a quarter mile.

He was carried into the farm house, and received medical attention from Dr. F. K. Kolb of Granville, North Dakota, who conveyed him next day by auto to the North Dakota Tuberculosis Sanatorium, a distance of seventy miles.

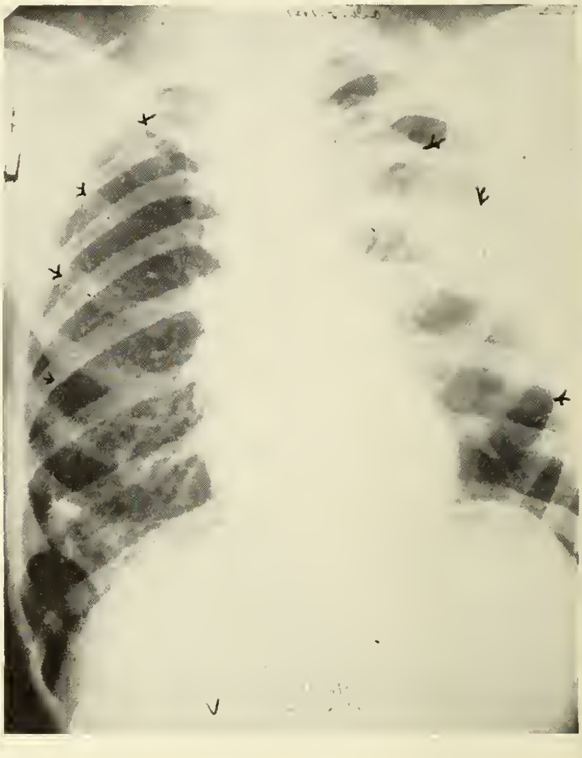


Fig. 2. October 5. Second day. Skiagram following aspiration of 1,500 c.c. of air from left pleura. Left lung is partially expanded; heart and mediastinum drawn to left of former position; apparent increase in right pneumothorax.

The first plate (Fig. 1), taken upon admission, indicated almost complete collapse of left lung, and a well defined air-space on the right side. The left upper lobe formed a dense mass close to the mediastinum, and moved freely with the cardiac impulse. There was moderate cyanosis, and rather profuse perspiration. Pulse 98, respiration 36, mouth temperature 98°.

Family History.—Father and mother are living, other members of family healthy. There is no history of tuberculosis contact.

Personal History.—He had always been well, except for occasional gastric disturbance, and had always lived and worked with his father on the farm. He had had no infectious diseases of childhood.

Examination.—The patient is a white male, well nourished and weighing 145 pounds.

The entire left side of the chest presents a hypertympany with absence of respiratory sounds and a

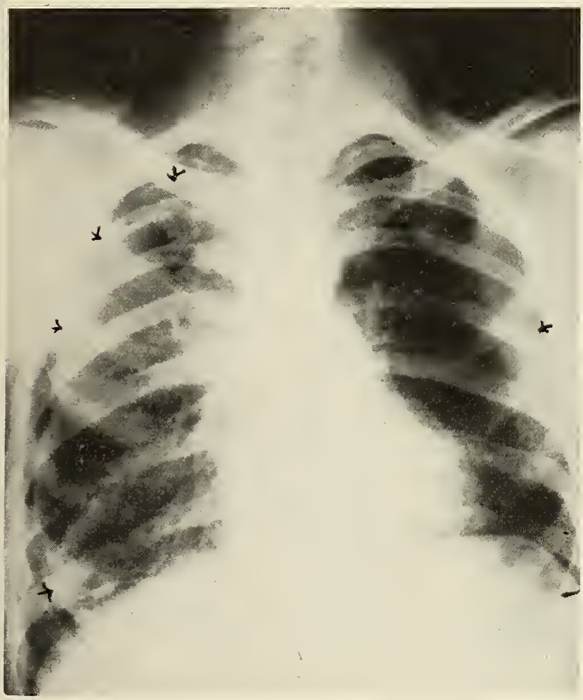


Fig. 3. October 10. Left lung is more fully expanded; heart in better position; right air-space smaller; atelectatic areas in right lung field.

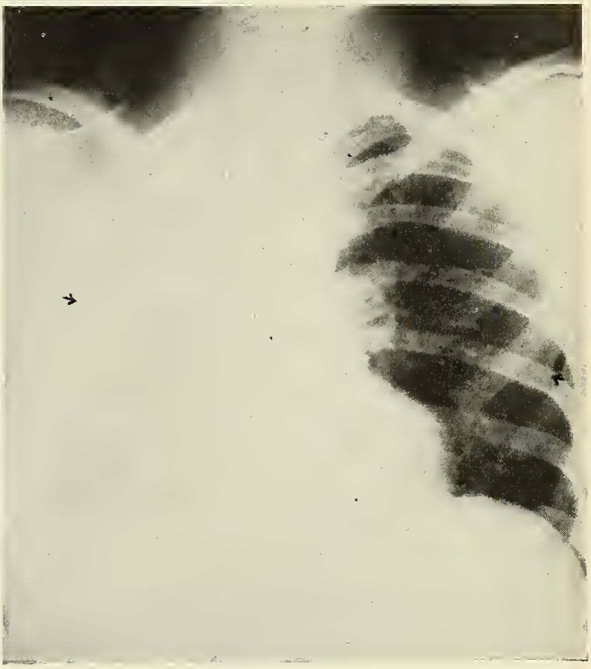


Fig. 4. November 25. Left lung is expanded; right lung field and air-space more completely obscured.

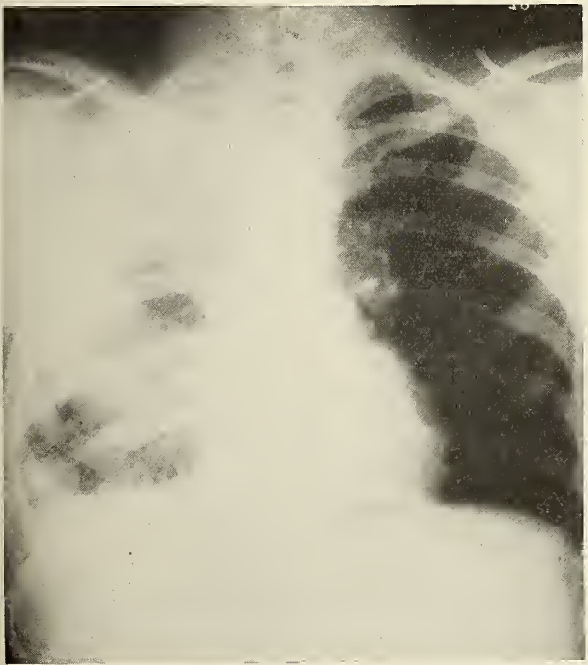


Fig. 5. December 29. Partial clearing of right lung field. There is complete expansion of left lung; small air-space in right costal angle.

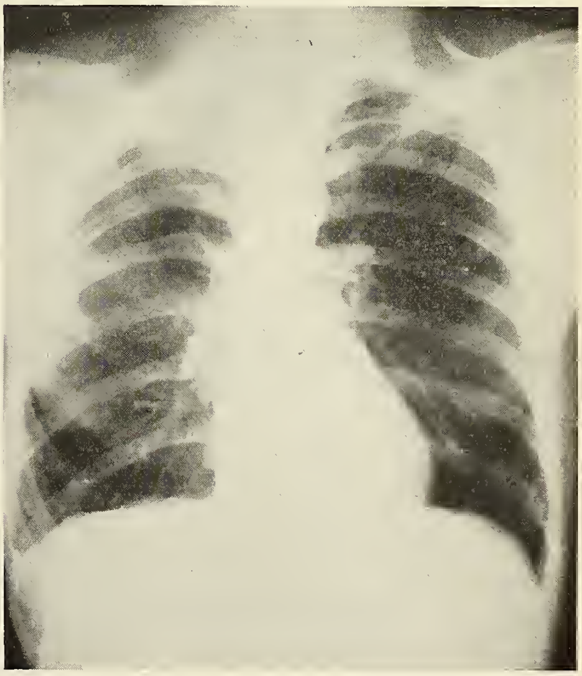


Fig. 6. September 21, 1930. Three years following attack. There is diffuse fibrosis in right upper lobe and left apex.

definite bulging of the chest wall. The respiratory murmur on right side is distant, except posteriorly. No râles are heard.

Course.—October 5, 1927, the left pleural space was aspirated in the eighth interspace, with an ordinary pneumothorax needle, and vacuum bottle. After 1,500 c.c. of air had been withdrawn, the operation was discontinued, because of a spasm of coughing. There was prompt relief from dyspnea, and Plate II was made within an hour, which indicated moderate expansion of the left lung, improved heart position, and slight increase in the right pneumothorax.

For several days, the patient was fairly comfortable, and no further deflation was attempted. The temperature ranged, however to 101.8 and pulse 96, and October 10th a skiagram (Fig. 3) showed clouding of the right lung field, with areas of atelectasis. The left lung maintained good expansion. There was no apparent increase in the pneumothorax on the right side.

Until October 22, the daily temperature ranged 100 to 102.8 with much restlessness, relieved by opium.

Severe dyspnea recurred suddenly on the morning of October 22nd. Aspiration of 1,500 c.c. at 3:30 p. m. from the left side gave much relief. The temperature fell during this day below normal, and, except for a slight evening rise, continued so, during later convalescence. On October 23, 900 c.c. and 1,000 c.c. were again removed. Gradual improvement continued during November and December. On November 25, the patient was able to visit the *x*-ray room. The *x*-ray indicated dense clouding of entire right lung field (Fig. 4). This showed moderate clearing on December 29 (Fig. 5).

Patient was allowed to leave the sanatorium on January 6, 1928, in good physical condition. The sputum, always scant, was repeatedly negative for tubercle bacilli. Von Pirquet skin reaction was positive. Following a report from Dr. Kolb in September, 1930, that the patient was doing ordinary farm work, at home, a request was made for a skiagram. The view shown in Figure 6 was taken September 21, 1930, and indicates only a moderate degree of diffuse fibrosis in the right lung, and left upper lobe. Patient states that he feels entirely well.

Comment.—Bilateral spontaneous pneumothorax may occur in apparently healthy individuals, following unusual exertion. It is commonly a complication of tuberculosis, or other conditions resulting in localized emphysema, with accompanying attenuation of the adjacent pleura. No parenchymal lesion due to tuberculosis was evident in the case above described. It is improbable that air passes from one pleural space to the other, as the unilateral form rarely becomes extrapleural under positive tension.

Deflation by use of the reversed pneumothorax apparatus is of value, in selected cases.

Acknowledgment is made of the use of the *x*-ray files and records of the North Dakota Tuberculosis Sanatorium at San Haven, N. D.

BIBLIOGRAPHY

1. Bedford and Joules: Brit. Med. Jour., 18:93 (Aug. 10), 1929.
2. Benedict: U. S. Vet. Bull., 4:599 (July), 1928.
3. Bourne: Brit. Med. Jour., 526, 1921.
4. Briggs: Am. Rev. Tub. 12:183 (Nov. 25), 1925.
5. Donahue: U. S. Vet. Bull., 5:376 (May), 1929.
6. Elte: Nederl. Tijdschr v., Geneesk, 1:33 (Jan. 7), 1928.
7. Emerson and Boeler: Am. Jour. Roent., 10:126 (Feb. 23), 1923.
8. Gray, E. A.: Ill. Med. Jour., 35:252, 1919.
9. Greshey: Fortschr. a. d. Geb. d. Roentgenstrahlen, Kongressheft, 32:30, 1924.
10. Hazen: U. S. Vet. Bulletin, 4:628 (July), 1928.
11. Hawes, Jr.: Boston Med. and Surg. Jour., 186:528 (Apr. 10), 1922.
12. LeWald: Arch. Surg., 12:440 (Jan.), 1926.
13. Marshak: Jour. Am. Med. Assn., 70:1518, 1918.
14. Meyer: New York Med. Jour., 106:238, 1917.
15. Schmincke: Beitr. z. path. Anat. U. S, 80-692-696; u z. allg. Path., 80:692 (Oct. 5), 1928.

SUBACUTE BACTERIAL ENDOCARDITIS INVOLVING THE TRICUSPID VALVE ONLY*

REPORT OF CASE

HARRY OERTING, M.D.
Saint Paul

The case I present this morning is that of an adult white male, aged 46, who was admitted to my service at the Ancker Hospital, St. Paul, on October 27, 1929, complaining of fever, chills, cough, vomiting and pain in the chest of three weeks duration. The onset, October 6, 1929, was extremely sudden and violent, with chills and a high fever. He was very ill for two or three days and since that time he felt only fairly well, and the cough and pain in the chest did not improve very much. Three days before admission he began to have nausea and vomiting.

The past history is negative except that he has always been subject to frequent colds and has had pneumonia several times.

The positive physical findings on admission were dental caries, marked pharyngeal injection, mild cervical adenopathy, dullness over both lower lobes of the lungs, the left more than the right. The breath sounds were harsh, with many râles over the right side posteriorly. There was bronchial breathing over the left lower lobe. There was a friction rub over both lower lobes posteriorly. The heart was moderately enlarged, rate 120, and the tone quality was rather poor, but otherwise there seemed to be no abnormality. No murmurs or bruits were heard. The abdomen and extremities were negative. The temperature was 100 F. and the blood pressure 115/90. The tentative diagnosis on admission was bronchopneumonia, pleurisy with effusion and a questionable empyema.

The laboratory data follow: Urine 1.020; albumin a faint trace with occasional hyaline and granular casts and a few blood cells. Stool negative. Wassermann positive. Blood chemistry: creatinine 2.8 mg.; urea N.

---

*Presented before the Minnesota Society of Internal Medicine, Duluth, Minn., May 26, 1930.

160.3 mg. Blood: Hgb. 59%, r.b.c. 3,190,000, w.b.c. 12,000. *X*-ray: Heart definitely enlarged, 6.5/11.3, comprising 58% of the chest diameter. Lungs: Infiltration at both bases which may be inflammatory but is probably due to congestion. There is a thickened interlobar pleura on the right between the middle and lower lobes. Possibly a resolving pneumonia. Sputum negative for Tbc. On October 31st thoracentesis was done and 40 c.c. of a clear straw colored fluid was removed which showed nothing microscopically.

The general condition remained about the same and daily observations failed to reveal any heart murmurs. On October 31st the patient became irrational, the temperature rose to 101, the white blood count was 17,800. The physical findings were not unlike those on admission. The spleen and liver were not palpable and no petechial spots were present. The condition remained about the same until November 4, 1929, when there was a sudden change. The breathing became very labored, the pulse very weak, the liver was definitely palpable, the spleen was not felt, the lungs showed a diffuse patchy tubular type of breathing over both lungs posteriorly. Numerous petechial spots appeared over the back, chest and extremities. The heart tones were rough and slurred but there was no murmur. At this time a diagnosis of subacute bacterial endocarditis was made with no definite idea of which valve was involved; bronchopneumonia; left pleural effusion; congestive heart failure.

On the afternoon of November 4 the patient died and the following are the essential autopsy findings:

Pericardium normal.

Heart.—Weight 400 grams. Mitral and pulmonary leaflets are normal in appearance. The aortic leaflets are sealed together at the commissure but there is no evidence of an acute vegetative lesion. The tricuspid leaflet shows a large thrombotic vegetation which measures about 3 × 1.5 cms. This is situated on the posterior tricuspid leaflet. It is soft and friable. Scattered over the balance of the valve there is a rather diffuse vegetative lesion which is flat and fairly firm. This does not resemble the small nodular type of lesion seen in pneumonic endocarditis. There is no evidence of luetic aortitis. The coronaries are normal. There is no gross evidence of excess fat or fibrosis. The myocardium is flabby and after cutting is found to be pale and swollen in appearance.

Pleural Cavities.—The left pleural cavity contains about 500 c.c. of clear straw colored fluid.

Lungs.—Consolidation along the posterior border of the right lung. Scattered throughout the lung are numerous nodules with a firm consistency and situated beneath the pleura. On cutting, these nodules are yellowish in color and well defined from the balance of the lung tissue. The left lung shows consolidation involving the lower portion of the upper lobe and the posterior portion of the lower lobe.

Spleen: The spleen weighs 94 grams. There are several well defined areas of infarction.

Kidneys.—There is no evidence of infarction.

Post-mortem Diagnosis. Subacute bacterial endocarditis (tricuspid). Multiple infarcts of the right lung and spleen. Bronchopneumonia, bilateral. Splenomegaly. Meckel's diverticulum. Pleural effusion (left).

L. SOGGE, M.D.
President, Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE

A. S. HAMILTON, M.D.	Minneapolis
D. C. BALFOUR, M.D.	Rochester
J. T. CHRISTISON, M.D.	St. Paul
E. L. GARDNER, M.D.	Minneapolis
JOHN M. ARMSTRONG, M.D.	St. Paul
R. E. FARR, M.D.	Minneapolis

CARL B. DRAKE, M.D., St. Paul	Editor
Lewis M. Daniel, M.D., Minneapolis	Assistant Editor

Associate Editors

A. B. Stewart, M.D., Owatonna	First District
F. M. Manson, M.D., Worthington	Second District
Geo. B. Weiser, M.D., New Ulm	Third District
H. B. Aitkens, M.D., LeSueur Center	Fourth District
F. U. Davis, M.D., Faribault	Fifth District
E. L. Gardner, M.D., Minneapolis	Sixth District
Paul Kenyon, M.D., Wadena	Seventh District
O. E. Locken, M.D., Crookston	Eighth District
E. L. Tuohy, M.D., Duluth	Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV January, 1931 No. 1

DOCTORS' BILLS

It is perhaps not strange that the medical profession in Minnesota is not greatly impressed with the cry that is heard so frequently about high doctors' bills. The fee schedule varies greatly and in Minnesota is very moderate compared to that in the large eastern cities.

Are doctors' fees so exorbitant? Compare them with those of an attorney in the same community. Or, compare the sum total with the sum spent for tobacco, cosmetics, radios, automobiles —all of them less important commodities.

The main difference, however, in medical expense compared with other expense, is that no provision is made in the family budget for medical expense, and the total cost to the nation is not evenly distributed. Inquiry would show that there are few individual accounts that run over $300 a year. A fee of this amount, however, would represent only a portion of the total cost of any particular illness. It must be admitted that in an appreciable, though small, percentage of instances, the financial burden due to serious or protracted illness is a heavy burden.

An article by the Director of the Twentieth Century Fund* offers food for thought. The author praises the scientific attainment of the profession but deplores its lack of organization in rendering medical service. He sees great opportunities for economizing in group practice. We doubt whether the existing medical groups can show any marked reduction in medical costs to their patients. Medical fees in any locality are much the same whether services are rendered by physicians as individuals or in groups. The author is keenly interested in the insurance plan. We have been and are. The author's recommendation is a combination of group practice and insurance by so-called guilds, thus combining the advantages of group practice and medical insurance in one unit. This guild would provide complete medical services to the families of members, including periodic examination for the detection of early disease, hospital and other medical services in case of sickness. It sounds well.

Various objections come to one's mind. There would be many opportunities for abuse of medical service furnished through insurance. The neurotic would be in his (her) glory. This individual would pester the life of the doctor more than at present. Every patient would demand day and night nurses and the most expensive room in the hospital, and minor illnesses might be prolonged inordinately. The individual would have to accept the services of the guild doctor and freedom of choice would not be possible. And, if freedom of choice as to medical attendant were permitted, the unscrupulous doctor could add to his fees. The main objection to the insurance plan for meeting medical costs is that so far it hasn't worked very well. To be a financial success, the rates would have to be rather high—according to the author mentioned, some $200 per working man's family. The average working man would take the chance that sickness or accident would not come to his family or that his bills would not amount to that much in a year and would not take out the insurance.

---

*Clark Evans: A Cure for Doctors' Bills. The Atlantic Monthly, October, 1930.

Sufficient statistics are not as yet available to warrant insurance of this sort. The author cited refers to recent studies carried out by the Metropolitan Life Insurance Company which showed that families of working men spent, on an average, $140 a year for medical care. Two-thirds of the total amount was spent by one-fifth of these families.

Possibly the study being made by the Committee on the Cost of Medical Care, of which Dr. Ray Lyman Wilbur is chairman, will be able to present figures reliable enough to warrant the issuance of policies to cover, if not the total cost to a family, two-thirds or three-quarters of the cost. Such a policy might eliminate most of the objections to insurance as the answer to the high cost of medical care. Such a solution would certainly be welcomed by the medical profession.

THE USE OF TOXOID FOR IMMUNIZATION AGAINST DIPHTHERIA

Since the discovery by Behring in 1913 that active immunization against diphtheria could be produced in susceptible individuals by injecting small amounts of a carefully prepared mixture of toxin-antitoxin, much investigative effort and experimental research has been done to overcome the objectionable features of the procedure. The reactions to the early preparations of toxin-antitoxin were often so severe that it created in the minds of both physicians and laymen, if not a feeling of opposition, at least a feeling of reserve, regarding the routine use of the mixture for diphtheria prevention.

Park and Zingher, in New York City, by using considerably smaller amounts of toxin, were able to prepare a mixture of toxin-antitoxin which practically eliminated the severe reactions associated with the giving of the earlier preparations. In 1924, Zingher[1] reported the immunization of 91 per cent of a large group of susceptible New York school children, as shown by negative Schick tests six months after giving of three doses of 1 c.c. each of .1 L + toxin-antitoxin. No unfavorable reactions occurred incident to its use. Other clinicians have reported very much the same results.

Very largely as a result of the work of Park and Zingher, the use of 0.1 L + toxin-antitoxin for routine active immunization against diphtheria spread over the United States, with a marked reduction in the incidence of diphtheria in those areas where its use was prevalent. Coincident with the increased use of toxin-antitoxin for immunization appeared increasing numbers of reports of the occurrence of severe reactions to later therapeutic administration of horse serum. Due to the presence in the antitoxin component of toxin-antitoxin of small amounts of horse serum, many investigators believed that by the increased use of toxin-antitoxin an increasing number of children were being sensitized to horse serum. Other objections to toxin-antitoxin were the difficulties of preparations of the mixture, the difficulties of preservation of the material, the number of inoculations necessary to produce immunity, and the slowness of immunization, which required from four to six months to develop.

In 1923, while the very excellent work of Park and Zingher in this country was directed toward dilution of the toxin in toxin-antitoxin mixtures in order to overcome the undesirable reactions incident to its use, Ramon,[2] working in the Pasteur Institute and American Hospital at Paris, produced a modification of diphtheria toxin by the addition of a small amount (4 c.c.) of commercial formaldehyde solution to 1,000 c.c. of a standard diphtheria toxin preparation. When this mixture was allowed to stand for one month, at a temperature of 38 to 40 degrees C., it was found to be free of all the toxic properties of diphtheria toxin. At the same time it had the power to produce antitoxin, when injected into the body; the ability to retain these properties over a long period of time without special precautions for its preservation; and, further, the material contained no horse serum. This product was called anatoxin by Ramon. The same material, further modified and improved, is now more generally called toxoid.

---

[1] Zingher, Abraham: Proc. Soc. Exper. Biol. and Med., 22:462, 1924-25.

[2] Ramon, G.: Paris Med., 20:480 (Dec. 6), 1924.

In 1928, Ramon and Helie[3] reported their experiences with toxoid to the physicians in America. Since their report appeared, a series of clinical investigations have been carried on by numerous workers, attempting to determine the relative merits of the antigenic properties of toxin-antitoxin and toxoid.

Recently Harrison,[4] under very carefully controlled clinical conditions, gave 355 Schick-positive children, ranging from one to sixteen years, three doses of 1 c.c. of toxin-antitoxin. Four months later, the Schick test was negative in 64 per cent of the cases. Different lots of stock preparations varied in degree of effectiveness from 35 to 73 per cent. For comparison, toxoid, routinely prepared, was given to another group of 476 Schick-positive children. Some of the group were given three doses of toxoid (.5 c.c., .5 c.c. and 1 c.c.) at seven day intervals; others were given two doses of 1 c.c. each at an interval of thirty-one days. Schick tests about four months later showed production of immunity in 95 per cent of the cases. Twenty-seven children over six years of age were found previous to the giving of toxoid to be sensitive to the diluted toxoid and these children were given toxin-antitoxin. No local or general reactions incident to the use of either toxin-antitoxin or toxoid were reported. The low average percentage of immunity production recorded by Harrison with toxin-antitoxin would probably have been higher had the Schick test been applied six instead of four months later.

From the accumulating evidence, reports indicate that toxoid offers the advantages of smaller dosage, that immunity can be established in a shorter length of time, in a higher percentage of cases, and there is no horse serum in the preparation to produce sensitization. A disadvantage to the use of toxoid is the reaction which may occur in children over six years of age. This may be determined by testing in a manner similar to the Schick test, previous to the giving of the toxoid. In case the individual is susceptible, toxin-antitoxin can be given without unfavorable reaction.

R. L. W.

PNEUMOCOCCIC SERUM

The serum treatment of pneumonia has had few enthusiastic supporters since it was first used before the war. The fact that the horse does not respond readily in the formation of antibodies to the various types of pneumococci has necessitated the administration of large doses of the unconcentrated serum and repeated intravenous injections. The serum reactions were so frequent and often so severe that the method has never become generally popular. The writer was not favorably impressed by a limited experience with this form of pneumonia treatment in an army hospital during the war.

Recently, however, reports have appeared in the literature, of series of type one pneumonia treated with a serum refined and concentrated according to Felton's method, showing a mortality reduction of ten per cent or more compared with control series. Serum reactions occurred in only ten to twenty per cent of the cases treated, which is much less than was experienced with the unrefined serum.

If one patient in every ten with pneumonia of type one can be saved by this serum, the method is worth while even though the serum treatment is expensive and costs $100 or more per patient. Even the most ardent advocate of the reduction of the costs of medical care would not think the price too great if it increased his chances of recovery ten per cent. The type one group of pneumonia is the most prevalent one, amounting to approximately a third of pneumococcic cases, and roughly, a third of these patients die.

The mortality from pneumonia and even that from the various types of pneumococcic pneumonia, is so variable in different localities, during various seasons, and in the different kinds of hospitals, that an evaluation of a therapeutic measure of this sort has been difficult.

The evidence now on hand, however, of the value of Felton's serum, merits the earnest attention of the profession.

HISTORY COMMITTEE

In these days of laboratory and machine-made diagnosis and treatment, it is difficult to realize how the generations preceding ours practiced medicine. Diagnosis and treatment were personal and an art. Reading the old works shows as much keen clinical observation. That is often lacking nowadays. Who knows whether our first physician possessed a stethoscope or understood the art of percussion? The clinical thermometer was used in St. Paul for the first time about 1870 and we know who brought it here and have one of that era. Do you realize that the hypodermic syringe was not used in the United States till 1856 and that the use of the clinical thermometer and microscope is not mentioned in the Harvard Medical College catalogue until 1867-1868? A Minnesata physician in a case report published in 1856 stated that a microscopic examination of a tumor of the stomach showed cancer cells. Can you inform your Historical Committee anything more about the use of these instruments in the early days in Minnesota?

---

[3] Ramon, G., and Helie, G. I.: Jour. Am. Med. Assn., 91:1028 (Oct. 6), 1928.

[4] Harrison, W. T.: United States Treasury Dept. Public Health Reports—U. S. Public Health Service, 45:1883.

J. M. A.

OBITUARY

Dr. Frederick A. Dunsmoor

1853-1930

Dr. Frederick A. Dunsmoor, one of Minneapolis' outstanding surgeons for almost a half century, founder of the old Minnesota Hospital College and one of the organizers of the medical college at the University of Minnesota, died December 16, 1930, at his home in Hollywood, California, where he lived for the last five years.

Dr. Dunsmoor, who was 77 years old, was born in the Richfield district of Minneapolis. He attended high school in Minneapolis and the University of Minnesota. In early life he determined to go into the medical profession and at the age of 16 years entered the office of Drs. Goodrich and Kimball to study medicine. Subsequently he went to New York, where he was graduated from the Bellevue University and hospital.

Coming back to Minneapolis, he was in partnership for a time with Dr. H. H. Kimball. In 1877 he began to practise independently. About the same time, he accepted a position as professor of surgery in the St. Paul Medical College, where he taught two years. In 1879 he was county physician for Hennepin County.

Dr. Dunsmoor then accepted the chair of surgery in the medical department of Hamline University, which he held two years, resigning to devote himself to the organization of the Minnesota Hospital College.

He bought the old Winslow hotel on Main Street N. E., Minneapolis, and started the college in cooperation with several other physicians and citizens. Then, in 1884, he founded the first eye, ear and nose clinic in the Twin Cities.

He served as vice president and dean of the college besides being professor of surgery, surgeon to the dispensary and attending surgeon to the hospital. While he was in this position, the institution and the St. Paul Medical College were merged to form the medical college at the University of Minnesota, where he was appointed to the chair of clinical and operative surgery, which he held until 1913.

He had an active part in the development of Asbury Hospital and served as surgeon at different times at St. Mary's, St. Barnabas, Swedish and City hospitals. He was also surgeon at different times for more than a half dozen railroads.

Dr. Dunsmoor made it a custom to spend a short vacation each year in study in the great hospitals, colleges and scientific centers of this country and abroad. His articles on his specialties appeared in leading medical journals and he was recognized for his skill as a surgeon throughout the medical world.

Physicians who have worked with him not only praise his skill as a surgeon but also point out that he was always ready to give his service, whether or not the patient had the money to meet the expense.

He was a member of the Hennepin County Medical Society, the Minnesota State Medical Society, the American Medical Association, the Academy of Surgeons and various other medical and surgical organizations.

Dr. Dunsmoor was a charter member of the Minneapolis Club and the Commercial Club, now the Civic and Commerce Association. He was also a member of the Lafayette Club and the Hennepin Avenue Methodist Church, where he served in official capacities for many years.

In the early '80s Dr. Dunsmoor built a home on Tenth Street that was the show place of the city for many years. After the business district expanded to that locality, he moved to a home at Lake Minnetonka.

He was one of the pioneers in building summer homes in the northern part of the state. About 25 years ago he constructed an immense summer home on an island in Rainy lake, 15 miles east of International Falls. He named the island "Minisenot," which is the Indian word for "Home Island." The home is now the property of Dr. N. H. Scheldrup of Minneapolis, husband of a niece of Dr. Dunsmoor.

Dr. Dunsmoor was greatly interested in the beauty and health resources of that territory and at a hearing before the international joint commission at International Falls in 1925, was the first person to publicly suggest the development of an international park in that region which is now under consideration and which the American Legion and the Canadian Legion have suggested be made a memorial to men of the two countries who gave their lives in the war.

Dr. Dunsmoor moved from Minneapolis because of failing health, but he returned for frequent visits. He visited there last summer, at which time he spent almost two months at his old summer home at Rainy lake. He was then subject to heart attacks, of which his death was the result.

Surviving him are two daughters, Mrs. Homer P.

Clark, St. Paul, and Mrs. Frederick W. McCartney, Denver; a brother, Dr. John Dunsmoor, Los Angeles, and three nieces in Minneapolis, Mrs. A. W. Armatage, Mrs. Horace Lowry and Mrs. N. H. Scheldrup.

Dr. W. H. Hallowell

1853-1930

Dr. William Henry Hallowell, physician in Minneapolis for 47 years, died Sunday, December 14, 1930, at Rosedale Hospital following a heart attack.

Dr. Hallowell, who was 77 years old, was born in Philadelphia. He was a graduate of the United States Naval Academy at Annapolis, and an officer in the navy for two years. At that time he won medals in double sculls and as a member of Navy sculling crews.

He was later graduated from the medical department of the University of Pennsylvania, coming to Minneapolis in 1883.

He was a member of the Hennepin County Medical Society, and, before the medical college at Hamline University was consolidated with the University of Minnesota, was head of the obstetrics department there. He had a large charitable practice among the poor for many years.

Surviving Dr. Hallowell are a son, C. C. Hallowell, manual training instructor in the Minneapolis public schools; a daughter, Mrs. Helen Leach of Bremerton, Wash., and a brother, Dr. Charles E. Hallowell of Philadelphia.

Dr. Andrew E. Anderson

1859-1930

Dr. Andrew E. Anderson, one of the founders of Swedish Hospital, died December 11, 1930, at his home in Minneapolis.

Born in Sweden April 2, 1859, Dr. Anderson had been in the United States for 57 years and a resident of Minneapolis for 33 years. One of four doctors who started the Swedish Hospital, he had been on the staff ever since. He was a member of the Hennepin County, Minnesota State, and American Medical Associations. He was a graduate of the Colorado University school of medicine and started practice in Ironwood, Mich.

Surviving Dr. Anderson are his wife, a daughter, Bessie, Iron Mountain, Mich.; two brothers, Albert Malmgren, Marquette, Mich., and S. Malmgren, Ishpeming, Mich.

Dr. Dwight F. Brooks

1849-1930

Dr. Dwight F. Brooks, Saint Paul, though identified prominently with the lumber industry, retained his medical licensure in Minnesota. Born at Redfield, New York, June 10, 1849, he came to Minnesota when a boy of seven, when his father, also a physician, settled at Beaver, a small village in Winona County, Minnesota. Six years later the family moved to Minneiska, a thriving town in the same county. His father later entered the grain business and tried to dissuade his son from pursuing the study of medicine, but in vain. Dwight Brooks, at the age of eighteen, matriculated at the University of Michigan, later attending the Long Island College hospital, where he received his degree in June, 1876. After practicing at Minneiska for a few years, his father's business enterprises claimed more and more of his time. Lumber came to be allied with the grain business and some fourteen branches of the business were established in Minnesota and North Dakota. When, in 1886, a yard was established in the Midway district in the Twin Cities, Dr. Brooks made his home in Union Park, Saint Paul.

In 1894 an alliance was made between his company and that of Scanlon, Gipson and Company, which later became the Brooks-Scanlon Lumber Company. Lumber activities extended to Oregon, Florida, the Bahama Islands, British Columbia as well as Minnesota.

In September, 1875, Dr. Brooks married Anna E. Keyes of Winona. A brother, Anson S. Brooks of Minneapolis, and three sons, Harry K. Brooks of Bend, Oregon, S. S. Brooks of British Columbia, and Edward Brooks of Minneapolis survive him.

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

State of Minnesota *vs.* Olga Stenhoff

On December 2, 1930, the State Board of Medical Examiners revoked the massage license of Olga Stenhoff, formerly residing at 2021 Columbus Avenue, Minneapolis, Minn. The defendant was convicted on her plea to the charge of abortion on the third day of October, 1930, in the District Court of Hennepin County. At that time the defendant was sentenced to serve not to exceed two years in the Women's Reformatory at Shakopee, Minnesota, where she is now imprisoned.

MEDICAL BOARD REVOKES LICENSE OF MINNEAPOLIS PHYSICIAN

On Tuesday, December 2nd, the Minnesota State Board of Medical Examiners revoked the license of Philip Mueller, physician and surgeon, with offices at 109 So. 9th St., Minneapolis. The Board found Mueller guilty of immoral, dishonorable and unprofessional conduct, the particular offense being the habitual indulgence by Dr. Mueller in the use of morphine sulphate.

This is not Mueller's first difficulty with the law. On June 6, 1913, the Supreme Court of Minnesota affirmed Dr. Mueller's conviction of manslaughter in the first degree. Dr. Mueller at the time served two years in the State Penitentiary at Stillwater. Dr. Mueller's conviction followed the death on May 17, 1912, of a married woman on whom an abortion had been performed.

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Senator Jones and "Medical Socialism"

On December 8, the Chicago Journal of Comerce printed as its leading editorial an interesting comment on the Jones bill which its author wishes to bring to a vote in this session of the United States Senate. The editorial printed there in full was called "Medical Socialism." It is one of several editorials on medical matters that have appeared of late in the Journal.

"Senator Jones of Washington is seeking a vote on his bill for an annual appropriation of $1,000,000 to provide medical treatments for mothers and children," says this editorial. "Legislation of this kind has been enacted before but its life has been limited to a term of years. Always it has been argued that the assistance of the federal government in these enterprises was only a transient necessity. But Senator Jones would make it permanent. The federal government is permanently to join with the states in supporting doctors who provide medical treatment for expectant mothers, nursing mothers, mothers past the nursing stage, young babies, older babies and children as old as seven or eight years. Naturally, the $1,000,000 appropriation will increase and the medical activity of Uncle Sam will be expanded. The medical socialist bill of Senator Jones is part of the general socialist movement which is engulfing the United States."

The dark view of things taken by the *Chicago Journal* is not wholly shared by physicians themselves. They know better than any, perhaps, what is the real state of mind of their patients and what reaction is to be expected from them if the state medicine bugaboo should become a universal fact.

"Our patients do not want us to abdicate our position of trust, confidence and independence to become government employes," Robert M. Burns, of St. Paul, declared to members of the Red River Valley Medical Society at Crookston recently. "They would rather, far rather, bear the hardships of private medical costs than accept state medicine.

"While we have gained much knowledge from foreign countries we cannot accept their system of practice. It would be a misfit here, a fatal departure from American traditions. Our constitution guarantees.to all the blessings of liberty."

Dr. Burns also pointed out that state medicine has very little to offer that will solve the difficult problem of the costs of medical care.

"We have full respect for those of our profession who are already doing work that might be considered a sample of state medicine. They have chosen their line of work for one reason or another, according to their adaptability. It is largely a matter of administration and enforcement. They are an essential group to the medical profession but their work is entirely different from the private practice of medicine. It is unthinkable as well as undesirable that we should all follow their example."

PRESIDENT'S LETTER

THERE was a time within the memory of all of us when physicians banded themselves together only for the advancement of science. Their officers were invariably men of conspicuous scientific achievement.

Last July, the Minnesota State Medical Association occupied itself during several important sessions of the sixty-second annual meeting with such unprecedented matters as state and national legislation affecting the profession, economics, veterans' relief, cost of medical care and the public relations of the physician. At that session the state association also elected a country doctor for its president.

I find these very interesting and important commentaries on modern medical practise. That is partly, perhaps, because I happen to be the country doctor chosen. Partly it is because they demonstrate the evolution from purely scientific medicine to social medicine which has come about in America in the last twenty years.

This striking evolution is going on in all of the learned professions but in none so conspicuously as in medicine. It is the inevitable sequel to the striking economic and social shifts of the times.

The doctor has discovered of late that it is not enough to write learned papers to read to his confreres or to distinguish himself in his practise. He has been obliged to form an offensive-defensive alliance with his confreres for his protection as well as the protection of the public. He must battle against the cultist and the fake healer, invested as these latter are with all of the power and glory of modern high power advertising. Upon him, he has found, rests the burden of solution of those baffling problems involved in the high costs of medical care, problems that are inextricably tangled up with all of the economic anomalies and perplexities of modern American life. He must forthwith fortify himself and his profession against the socialistic and bureaucratic tendencies of the times, lest the freedom and integrity and essential ideals of medicine be lost.

It goes without saying that the representatives of this new phase of organized medicine must be men of wide contacts and practical knowledge of organization. It is no longer incompatible with the dignity of the profession and of its glorious traditions that the man chosen to head it during 1931 should not be its most illustrious physician.

For myself, however, I can think of no adequate reason why the great state organization of physicians in Minnesota should have chosen me for the job of president in 1931. I cannot promise to follow with any distinction in the footsteps of my predecessors. I cannot promise more than to conduct myself and the business of this organization as worthily and honestly and energetically as I am able.

But I have had, as it happens, a considerable experience unofficially, with Minnesota politics and Minnesota legislators, and I can promise, knowing the men who have consented to serve on the Legislative Committee of the State Association, that the vitally important legislative program of our organization will be carried on effectively this year.

In fact, I ask every member of the Association to read over the membership of all our committees. It should inspire confidence in the whole association to note again the high type and quality of men willing to work for the good of the medical profession.

Fortified by this confidence, I start now upon one of the most important years and undertakings of my life. I pledge my fellow members of the Minnesota State Medical Association who have placed their trust in me, the utmost of my abilities and energies and strength in their behalf.

L. Sogge

President
Minnesota State Medical Association.

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have a patient with a definite pernicious anemia who has been on liver treatment for some three years or more. The blood picture is staying up well but for the past four or five months the patient has had a lot of trouble walking. She falls and stumbles very easily, and now cannot walk at all without help. I am wondering if anyone has reported any cases of pernicious anemia where the blood picture has remained practically normal on liver therapy and yet there has been a gradual increase in the cord symptoms. Is there any special type of treatment that will help diseased cord symptoms? She apparently needs no treatment as far as the blood goes.

   Answer.—Early reports regarding improvement in involvement of the nervous system were pessimistic, but more recently they have been more encouraging. There have been several reports which indicated that the patient developed cord changes after the blood had returned to normal. B. M. Baker, Jr., Bordley, J. B., III, and Longcope, W. T., MINNESOTA MEDICINE, XIII:815, (Nov.), 1930, report forty-four cases of pernicious anemia in which there were symptoms referable to change in the central nervous system who have been treated by liver or a combination of liver and liver extract. Of twenty-three cases followed for more than six months, improvement in symptoms and signs occurred in 55.17 per cent. In twenty-one cases treated less than six months improvement was noticed in only 31.25 per cent. In eight cases of outspoken subacute combined degeneration, treated for more than tei months, there was improvement in symptoms and signs in 58.9 per cent. They state that it is essential that large quantities of liver, or liver and liver extract, be employed over long periods of time. They recommend 400 grams of liver or more daily or its equivalent. No results need be expected in less than six to eight months. The longer the patient continues the treatments, the less liable it is for remission to occur.

2. *Question.*—A primipara has engaged me to confine her later on this month. Her urine looked bloody on examination and I found it loaded with albumin. I had her wash off the parts thoroughly before collecting the same so as to avoid contamination. Can you outline a course of treatment? What is the prognosis for mother and baby?

   Answer.—The dark colored urine is either due to blood or concentration. It would be advisable to do a microscopic examination of the sediment before deciding which was the cause. Albuminuria in a pregnant woman may mean toxemia of pregnancy. It is advisable to make blood pressure examinations although toxemia might be present without elevation of the blood pressure. Usually edema can be found. Non-renal causes of albuminuria are cystitis, pyelitis and contamination from the external genitalia. While looking for red blood cells, it would also be advisable to look for pus cells. If you make a diagnosis of toxemia of pregnancy, the patient should be put to bed, the intake and output watched, and a restricted protein diet given. It is also advisable to increase the carbohydrate in the diet and to make frequent observations of the blood pressure. The fetus may be dead at this time. The prognosis for the mother in toxemia pregnancy is usually good but not so good for the fetus. You had better examine the urine and if only albumin and casts are present, treat the patient as a potential toxemia case.

3. *Question.*—A married man, while working with a thresher got a barley beard in the lower lid of his left eye. The beard pierced the lid. The eye pained him so intensely that he was taken in for examination and treatment. He arrived two hours after the accident. A portion of a barley beard was removed. The pain was so great, however, through the night that he returned for a second examination and treatment, and more of the beard was found and taken out. He did not obtain relief. The following day the pain was more severe and examination revealed an acute left frontal sinusitis. What is the etiology of the frontal sinusitis? Could this be secondary to an infection in the eye? If so, by what route? Was it through the duct up the nose? Through the lymphatics or through the blood stream? Is the sinus infection entirely incidental?

   Answer.—It is possible for a conjunctivitis to invade the sac of the lacrymal duct and go up through the nose to the frontal sinus. This is rather remote, however, and the acute frontal sinusitis is probably an incidental affair. If it did occur, it would probably be through the duct and not through the blood stream or lymphatics.

4. *Question.*—A nine year old girl turned her right ankle. X-ray the next day showed the fibular epiphysis a trifle wider than the tibial and the toes swung in. I put it up straight. There has been no pain and she can extend the foot and swing it to both sides. The swelling is almost gone (26 days) and almost no tenderness can be elicited on manipulation. But ecchymosis is still present and apparently not fading below the tibia. Except for this, I would think that everything was fine, but fear non-union on account of the delay in absorption of the blood.

   Answer.—Your patient apparently had an epiphyseal separation and was well treated. The almost complete disappearance of swelling, absence of tenderness on massage and manipulation, and active motion of the foot indicate that she is making satisfactory progress. The fact that ecchymosis still persists is probably independent of the injury to the bone. Conversion of blood into pigment and absorption may be delayed under circumstances over which we have no control. If she does not make satisfactory progress, please let us know, but the opinion expressed was that she was doing all right and that the blood would probably clear up within the next few weeks. As long as two months may elapse before the blood disappears, according to the literature.

5. *Question.*—Please give me the treatment for inevitable abortion.

(Continued on page 108)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M. D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of January will be as follows:

January 7—Carbon monoxide poisoning.
January 14—Peanut bronchitis.
January 21—Cause of the common cold.
January 28—Cancer of the breast.

A. M. A. EXHIBITS

Applications for space in the Scientific Exhibit at the next annual meeting of the A. M. A. to be held at Philadelphia next June, should be made to Thomas G. Hull, Director of the Scientific Exhibit, care of A. M. A. Completed application forms should be in the hands of the director by February 20.

1931 STATE MEETING

Three major symposia on Infant and Maternal Welfare, Diagnosis and Therapy, were proposed for the scientific program of the seventy-eighth annual meeting of the Minnesota State Medical Association by the Committee on Scientific Assembly at its first meeting in St. Paul, Saturday, December 13, 1930.

The annual meeting will be held May 4, 5 and 6, at the Nicollet Hotel in Minneapolis with a morning session at the University Hospitals and Medical School.

Members of the Committee present were A. E. Hedback, W. H. Condit, J. A. Watson, E. L. Regnier, W. A. O'Brien, of Minneapolis, Harry Oerting, E. A. Meyerding, St. Paul, P. G. Boman, Duluth, and A. W. Adson, Rochester. Their tentative arrangements for the May meeting provide for the Council meeting, Monday afternoon, May 4, and the House of Delegates Monday evening. Tuesday morning is to be devoted to clinics at the University Hospitals, Tuesday afternoon to the symposium on Infant and Maternal Welfare. The symposia on Diagnosis and Therapy are to occupy Wednesday morning and afternoon sessions respectively.

The annual banquet of the organization is scheduled for Tuesday evening at the hotel.

Dr. Ray Lyman Wilbur, secretary of the White House Conference on Child Health, will be invited to speak at the banquet. Dr. A. B. Kanavel, Chicago, professor of Surgery at Northwestern University and president of the American College of Surgeons, is expected to attend as one of a number of distinguished guests and speakers.

Invitations will be sent out to the entire membership to make further suggestions as to the program and to participate with papers. The next meeting of the committee will be January 24, 1931, at the Nicollet Hotel, Minneapolis.

RAMSEY COUNTY MEDICAL SOCIETY

At the meeting of the Ramsey County Medical Society, Saint Paul, November 24, 1930, Dr. O. W. Holcomb was elected president, Dr. E. V. Goltz, vice president, and Dr. A. A. Schulze, secretary-treasurer (re-elected). Dr. Robert Earl was re-elected Trustee of the Boeckmann Library-Building Fund. Dr. Gordon R. Kamman presented a report of a case of "Alcoholic Polyneuritis with Cranial Nerve Involvement—Korsakow Syndrome" and Dr. Edward Schons gave a paper on "The Significance of Gas Distention in the Diagnosis of Small Intestinal Obstruction and Stasis (illustrated)."

WASHINGTON COUNTY MEDICAL SOCIETY

Washington County Medical Society held their monthly meeting November 11, 1930, at the Stillwater club rooms.

Dr. Emil S. T. Geist, of Minneapolis, the guest essayist for the evening, presented five reels of the original Bohler fracture moving pictures.

If you can visualize a dozen fellows close together in a dark room with only the pictures visible, and Dr. Geist to explain every important point, you can understand how enjoyable those privileged two hours were.

E. Sydney Boleyn, *Secretary.*

SCOTT-CARVER COUNTY SOCIETY

Lieutenant Governor-Elect Henry Arens addressed the regular December meeting of the Scott-Carver County Medical Society at Jordan, December 9, on "Medical Legislation." H. M. Johnson, chairman of the Legislative Committee of the Minnesota State Medical Association, and Mr. F. Manley Brist, investigating attorney for the Minnesota State Board of Medical Examiners, outlined the work of their respective organizations in initiating and enforcing the Basic Science law. Dr. I. J. Murphy, Minneapolis, read a paper on "Radium Therapy."

The next meeting of the society will be held at Chaska the second Tuesday in February.

RED RIVER VALLEY SOCIETY

E. A. Meyerding, secretary of the State Association, and R. M. Burns, St. Paul, were speakers at the annual meeting of the Red River Valley Medical Society, December 9, at Crookston. Dr. Meyerding talked on "Public Relations," and Dr. Burns on "The Trend of Medicine."

Henry Edstrom, Crookston, read a case report on "Myelogenous Leukemia."

The meeting was preceded by a banquet at the Hotel Crookston, to which members of the Ladies' Auxiliary of the society and others were invited.

NICOLLET-LE SUEUR COUNTY SOCIETY

The Nicollet-Le Sueur County Medical Society and the Le Sueur Commercial Club held a joint meeting at the Le Sueur club rooms, December 8, 1930. Mr. F. Manley Brist, attorney for the State Board of Medical Examiners, spoke on medical legislation and its enforcement.

CAMP RELEASE DISTRICT SOCIETY

At the annual meeting of the Camp Release District Medical Society held December 4, E. A. Meyerding, St. Paul, and S. H. Boyer, Duluth, president of the Association, were speakers.

Gregor Schoofs, North Branch, is the new secretary of the Chisago-Pine County Medical Society.

OLMSTED COUNTY SOCIETY

D. M. Berkman, Rochester, was elected president of the Olmsted County Medical Society at the Annual Meeting, December 9, at Rochester. Other officers for 1931 are A. B. Evarts, vice president, and M. C. Piper, secretary, both of Rochester.

WATONWAN COUNTY SOCIETY

New officers of the Watonwan County Medical Society are: W. J. McCarthy, Madelia, president; H. B. Grimes, Madelia, secretary-treasurer; F. L. Bregel, St. James, censor and delegate. The legislative committee for the society includes: O. E. Hagen, Butterfield; Albert Thompson, St. James; and H. B. Grimes, Madelia.

RANGE MEDICAL SOCIETY

The newly organized Range Medical Society, organized under the St. Louis County Medical Society, met Thursday, December 4, 1930, at Virginia. Dinner at the Fay Hotel was followed by a scientific meeting at the City Hall. B. S. Adams, Hibbing, addressed the latter meeting on "Fractures of the Fingers." C. B. Lenont, Virginia, talked on "Blood Transfusion," and C. W. More, Eveleth, on the American College of Surgeons meeting.

Officers of the new society for 1931 are: H. E. Binet, Grand Rapids, president; C. W. More, Eveleth, vice president; C. W. Bray, Biwabik, second vice president; Fred McK. Ruby, Hibbing, secretary.

RICE COUNTY SOCIETY

E. C. Rosenow, Rochester, addressed the annual meeting of the Rice County Medical Society at Northfield, December 11, 1930, on "Poliomyelitis." The following officers were elected: President, J. M. Murdoch, Faribault; first vice president, W. E. Wilson, Northfield; second vice president, Edmond Backe, Kenyon.

Dr. A. M. Hanson, Faribault, was elected delegate, with F. J. Lexa, Lonsdale, alternate.

Censors for the year are: W. H. Rumpf, Faribault; F. M. Babcock, Northfield; M. L. Mayland, Faribault.

The following members were appointed to act on the Publicity Committee: F. M. Huxley, Faribault; P. A. Smith, Faribault; O. P. Thorson, Faribault.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. S. S. Hesselgrave, St. Paul
Chairman Press and Publicity—Mrs. E. A. Meyerding, St. Paul
Editor—Mrs. A. A. Passer, Olivia

The Executive Board of the Women's Auxiliary of the State Medical Association held a regular meeting at the Lowry Hotel, St. Paul, the third of December. Nineteen members attended the session, which was addressed by Dr. E. A. Meyerding of St. Paul. Dr. Meyerding gave an illustrated talk on "The Minnesota Public Health Association and Its Co-relation to the State Medical Association." Mrs. S. S. Hesselgrave, president of the State Auxiliary, gave an interesting report of the meeting of the National Executive Board, which was held in Chicago the fourteenth of November.

The January meeting of the State Executive Board will be of a "legislative" nature. The Legislature will then be in session and the Women's Auxiliary will learn from the State Medical Association what will be expected of it in regard to legislative measures.

CAMP RELEASE AUXILIARY

Camp Release Auxiliary held its annual meeting at Granite Falls the fourth of December. Mrs. A. A. Passer, retiring president, presided at the business session, which was followed by a joint banquet with the Camp Release Medical Society. Speakers at the banquet were Dr. Boyer of Duluth and Dr. Meyerding of St. Paul. Dr. Boyer talked on "Organization," and Dr. Meyerding stressed the work of the Women's Auxiliary and gave that organization many helpful suggestions as to future usefulness. Camp Release Auxiliary has a membership of twenty-six, but due to the fact that the membership is widely scattered the activities have been mainly social. However, there is a growing interest in serious work, without which no auxiliary can long survive. The following new officers were elected: President, Mrs. J. S. Kilbride, Canby; first vice president, Mrs. M. C. Johnson, Dawson; second vice president, Mrs. G. H. Mesker, Olivia; secretary, Mrs. R. C. Adams, Bird Island; treasurer, Mrs. Leon G. Smith, Montevideo.

RAMSEY COUNTY AUXILIARY

The Women's Auxiliary of the Ramsey County Medical Society has issued an attractive Year Book containing the programs for the season. The December meeting was held at the home of Mrs. H. E. Hunt, 1490 Summit Avenue, Saint Paul. A talk on her recent trip to Russia was given by Mrs. Walter E. Ramsey. Following the talk tea was served with Mrs. E. M. Hammes and Mrs. A. G. Schulze presiding at the tea table.

Mrs. H. O. Skinner, 2190 Princeton Avenue, Saint Paul, will be hostess to the Auxiliary in January, and the March meeting will be held at the home of Mrs. Walter D. Brodie, 665 Montcalm Place. The activities of the Ramsey Auxiliary will be concluded in May with a picnic at the summer home of Mrs. Henry N. Klein, at Turtle Lake.

Mrs. E. M. Hammes is president of the organization. Committee chairmen appointed by Mrs. Hammes for the year are Mrs. C. K. Williams, philanthropy; Mrs. Karl Dedolph, program; Mrs. H. E. Binger, hospitality; Mrs. Philomen Roy, membership; Mrs. W. H. von der Weyer, ways and means; Mrs. J. Richards Aurelius, telephone; Mrs. H. O. Skinner, publicity; and Mrs. M. Keller Knauff, year book.

HENNEPIN COUNTY AUXILIARY

The Women's Auxiliary of the Hennepin County Medical Society held its annual Christmas party December 17 in the library of the society in the Medical Arts building, Minneapolis. Christmas carols were sung by a group of the members under the direction of Mrs. C. O. Maland. Two of the artist members of the auxiliary, Mrs. E. T. W. Boquist, soprano, and Mrs. Ivar Sivertsen, reader, gave the program. After the program a Christmas tea was served, arrangements for which were made by Mrs. Emil Geist, with Mrs. J. M. Lajoie as co-chairman.

We quote from the American Medical Association Bulletin the following ten points by Dr. H. W. Salus of Pennsylvania concerning the worth of such an organization as the auxiliary:

1. The Pennsylvania Auxiliary has made more progress in six years than the men's society in sixty.
2. The doctor used to bring his wife to conventions. Now the wife brings the doctor.
3. The auxiliary has added polish and refinement to these gatherings.
4. It has created a better bond of fellowship among the men and a lasting friendship among the women.
5. It has permitted the woman to become an integral part of the life of the man, socially, professionally and commercially.
6. It has spruced up the appearance of the men.
7. It has interested the local merchant and brought him business.
8. It has given the doctor much-needed rest and recreation in the midst of his serious scientific meetings.
9. It has brought daughters into more intimate relations with the medical interests of the family life.
10. It has stimulated the medical society not to be outdone in thought and activity.

HORMONE AND CANCER

The effort to influence the growth of cancer by various organ extracts is being widely made at present. Logically it might be profitable to inquire why such trials are being made, since every pathologist sees cancer growing freely in those organs whose hormonic activity is high. The work of Bishoff and his colleagues should be repeated with a tumor that does not spontaneously recede and, if the results are the same, should close the discussion on the possible therapeutic action of extracts from the group of organs tested. (Jour. A. M. A., November 1, 1930, p. 1350.)

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of November 12, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 12, 1930. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. E. S. Geist.

There were 43 members and 2 visitors present.

Minutes of the October meeting were read and approved.

The scientific program of the evening consisted of two theses and four case reports, as follows:

Dr. Alexander Stewart (St. Paul) read his Thesis entitled "Observations on Serotherapy in Scarlet Fever." (To appear in Minnesota Medicine at a later date.)

DISCUSSIONS

Dr. W. R. Ramsey (St. Paul): I think Dr. Stewart has covered the field very well. The effect of the serum antitoxin in the severe cases is very marked; as he said, it is sometimes spectacular. The disease is so treacherous that one is warranted in giving the serum, and now that the dosage is so small, that is, so concentrated, one is not likely to get serum sickness. The matter of prophylaxis is still very much in doubt. Parke, Zingher, and others have come to the conclusion that this is still in the experimental stage and have given no definite conclusions, but they hope to have collected enough cases and data to have something definite in the next year or two. Some of these cases do get a terrific reaction.

Dr. Frank Wright (Minneapolis): My experience with scarlet fever is limited to one case in which I was particularly interested. Eight years ago this child, then five years old, developed scarlet fever. She had a temperature of 104° and two nurses constantly for five weeks. She developed an adenitis—both sides of her neck—and a double otitis media and apparently was going to die. As a last resort it was decided to give her some foreign protein therapy. Not being able to find horse serum in the Twin Cities at the time, she was given diphtheria antitoxin. Her temperature had been 104°, and after this first dose it dropped to 102° in six hours. After the second dose her temperature dropped to normal and stayed normal, and in two weeks she was able to be taken south. Now whether or not it was due to diphtheria antitoxin, or the use of foreign protein, or whatnot, she got well.

Dr. H. T. Nippert (St. Paul): I should like to ask Dr. Stewart how he gives the serum, whether intramuscularly, intravenously, or subcutaneously; in very toxic cases would he advise the intravenous use?

With reference to Dr. Wright's remarks, I might add that before scarlet fever antitoxin came into use we had sometimes used diphtheria antitoxin and got fairly good results. We also used antistreptococcic serum and thought we got fairly good results with that too.

Dr. Stewart (in closing): Answering Dr. Nippert's question as to the method of administration, we give the serum intramuscularly except in some of the late cases we give it intravenously. The first serum that came out we gave intravenously. I recall one case which I tried giving it intramuscularly, before the serum was made up in the concentrated form. It took me about an hour and a half to give that much. We formerly had a lot of trouble and quite a lot of reaction.

In connection with Dr. Wright's remarks on the use of diphtheria antitoxin, we have used that a number of times and thought we got good results, but we get better results from the specific serum.

Dr. William H. Hengstler (St. Paul) read his Thesis on "Neurological Aspect of Head Injuries."

DISCUSSIONS

Dr. A. S. Hamilton (Minneapolis): I have listened to this discussion with great interest and think Dr. Hengstler has covered the subject fully, clearly and conservatively. It is certain that the number of head injuries one sees has increased in recent years; at least those that are classified in reports under the heading of fractures of the skull are so increased. No doubt the coming of the automobile and the speed at which it is driven is to blame for much of this increase, but the *x*-ray also is responsible for many of these reports. At least, it seems to me that what we now call severe fractures of the skull were in my early days called fractures; and those cases which we now see, where one physician sees a line and calls it a fracture and another physician, equally skillful and equally honest, sees the same case and doubts the presence of fracture, were all called concussion without question.

Of course, the *x*-ray has done a great deal to aid us in diagnosis but it is not the fracture of the bone which determines the severity of the injury; it is the degree of involvement of the brain covering, of the blood vessels, of the cranial nerves, and of the brain tissue itself, which determines the severity of the head injury, and here the *x*-ray does not help us greatly. In determining the severity of the injury, one must give close attention to the degree and duration of the unconsciousness. If the patient is in a condition of coma or even of profound stupor and remains so for two or three hours or more, it seems to me that we must assume something more than an ordinary concussion. Of course, in a world where nearly everyone seems to be insured, it is often difficult to get the exact facts. As an illustration of this, I was yesterday looking over two records of the same man. One was given by the man himself in which he recorded a statement of absolute unconsciousness for three hours following his injury. The other report, made by the man who assisted him, stated that he went for help directly after the accident and returned in ten minutes. The patient was sitting up and was conscious. With assistance, he got into an automobile and was driven several miles to a hospital. He was an Irishman and in the course of his journey, he laughed and joked, remarked that you could not kill an Irishman, smoked a cigar and was finally delivered in a conscious condition at the door of the hospital. This does not prove that the man was lying, for, in head injuries, all incidents are sometimes blotted out of the memory for a certain time so that the patient cannot go back and reconstruct his life. Certainly, however, the case where the man responds in a clear-headed way, even though he cannot afterward recall what happened, is very different from that one in which the individual is in a profound coma for a considerable period. Where there is loss of the deep reflexes and marked pupillary changes, including failure of the pupils to respond to stimuli, the case is certainly serious.

Unfortunately, it is very difficult at the present time to find any statistics which would be generally accepted as to what the results are likely to be in the average case of head injury. As I have already remarked, we are so generally insured against injury and the desire for a little compensation is so widespread that a motivating psychologic factor is very likely to develop symptoms which at best are often largely of a subjective character and keep alive these distressing phenomena which, without the compensation situation, would certainly long ago have disappeared.

Dr. Hengstler has referred to epilepsy following head injuries. Unfortunately, here again, we have no reliable statistics on which we may depend to determine the likelihood of epilepsy in any given case. I have seen statistics where epilepsy is said to have developed in cases of head injury with fracture of the skull in as high as thirty per cent of cases. Judged by my own experience, such a statement is ridiculous unless the author is dealing with a specially selected series of very grave cases. Like the author, as I understand him, I look upon epilepsy as a situation where there must be some fundamental constitutional condition and if trauma is to be looked upon as a cause of epilepsy, if the above opinion is correct, it must be looked upon only as a precipitating or exciting cause and not as the primary cause. I have, however, seen cases of convulsions of generalized character developing in cases following head injury where I can hardly assume the relationship was merely coincidental and I have felt that sometimes injury to the brain may bring on generalized convulsions.

What is known as delayed hemorrhage constitutes an interesting feature in a very limited percentage of head injuries but a sufficient number of cases have now been reported so that one cannot doubt their existence. The period between the time of injury and the onset of the cerebral hemorrhage may be anywhere from a day or two up to as long as a few weeks and it is worthy of note that in the cases of delayed hemorrhage reported there has frequently been found evidence of pathological conditions in the vessels so that the injury would have been looked upon ordinarily as only a precipitating cause.

Dr. J. F. Corbett (Minneapolis): I enjoyed this essay a great deal. As the paper was read, there went before my mind the positive indications for operation. First and foremost is the case where progressive symptoms develop, where there is a little bleeding from a vessel outside of the dura. The patient may develop paralysis, aphasia, unconsciousness, and finally reach the stage of medullary compression and die. These cases are common causes of death in head injuries. In the statistics of Le Cont in Cook County, a major part of the deaths from head injuries were attributed to extradural hemorrhage. The cure is operation. The operation is in simply removing the clot, if necessary the ligation of the vessel, and the outcome is pretty fairly good. I have had an opportunity to do this a little over thirty times and have had two deaths, and both of these were cases that reached the stage of medullary compression. Another indication for immediate operation is where there is a compound fracture. Thorough immediate débridement is imperative.

But there is another condition which demands immediate operation and that is a fracture extending into the sinus into the frontal bone. I recently had a case where an abscess developed into the frontal region that came from such a crack being neglected. Depressions are commonly corrected by elevation or removal of the fragment.

The spinal puncture needle is very valuable and I had certain rules at the General Hospital to follow in the use of spinal punctures, but every once in a while somebody would go wrong and use the spinal puncture where it should not have been used. There are cases where it should not be used. First, if your patient is in shock, do not use the spinal puncture. Second, if there is threatened embarrassment of the medullary centers, do not use spinal puncture. And, third, although it is difficult to lay down exact rules for diagnosis, where there is bleeding in a large vessel in the brain or skull you may get a fatal ending from using spinal puncture; but I do not know how you can anticipate that in advance.

Dr. Herbert Jones (Minneapolis): It seems to me this paper is very opportune at this time. We formerly had the injuries caused by horses and those were direct accidents. Then we passed into an era of railroad accidents in which the large element was that of shock. The saying among the old railroad surgeons was that the injuries were so severe that the tissues were shocked and the patient did not do well. These accidents have been largely overcome by the railroads. We are passing now into the age of automobile injuries. When an automobile hits a person that person is temporarily unable to control his head; that is, the head hits the ground or some object and we get the peculiar head injuries that we see in ever-increasing numbers. Those accidents are especially in the neurologist's field to deal with, as there must be a competent diagnosis in order to decide whether the person is so shocked that the outcome will be fatal if operated. A certain number must be operated upon in order to prevent devastating hemorrhage into the brain tissue. And the decision is a very important one. This paper is a very timely one.

Dr. J. C. McKinley (Minneapolis): Martland published an article on "Punch Drunk" in the Journal of the A. M. A. in October, 1928, which seems to me to bring up a point which is not appreciated in our consideration of concussion and contusion of the brain. He calls attention to the high incidence of commonly progressive neurologic syndromes (ataxia, tremors, Parkinsonian states) in prize fighters, especially those of the rough-and-tumble type of poor boxer who takes much head punishment over a considerable period of time. He thinks that the symptoms are due to petechial hemorrhages in the brain. Now we usually think of the knockout in a fight as a pure case of concussion without permanent injury, but obviously from Martland's observations a small amount of permanent damage is done to the brain with each knockout blow. The effects are cumulative until a full-blown neurologic picture develops. This indicates the difficulty, if not impossibility, of separating concussion, with its temporary effect of loss of consciousness, from contusion, with its permanent anatomical and often functional damage. One should be guarded in a given case in speaking of a concussion without contusion, as it is doubtful if such a circumstance actually occurs.

Dr. A. W. Ide (St. Paul): In our experience in railway work, head injuries have been becoming more and more infrequent. The few injuries that we do see are not caused by accidents incident to the operation of trains. Occasionally some one is injured as a result of a speeder accident. These speeders are small gasoline inspection cars. In spite of every precaution, the light cars sometimes leave the rails and throw the passenger from his seat.

It seems to me that one of the greatest problems in connection with head injuries is getting the men back on the job. Headache and dizziness persist and are very annoying. Patients are apt to be uncertain of themselves. They doubt their ability to continue work over prolonged periods.

A sympathetic attitude on the part of the physician is very necessary. These patients need encouragement.

Dr. Hengstler (in closing): I appreciate very much the discussion of this paper and wish to thank the gentlemen for it.

I want to say that I agree most heartily with what Dr. Corbett said about the use of spinal puncture, believing that spinal puncture should be used, but used with discrimination; and I agree with him that in cases of free intracranial hemorrhage, its outcome cannot be foreseen.

With respect to epilepsy, my experience with this following head injuries is somewhat limited. The cases that I have had have all been in connection with litigation and the patient was claiming epilepsy as a result of the head injury. Some claimed types of grand mal and some of petit mal, but in each instance investigation proved these individuals came from epileptic families where the history had been covered up. One can conceive of an individual who had epileptic parents and who has an epilepsy in abeyance, and then who experiences an accident which lights up this epilepsy. That, I think, might be admitted, but in my cases where they had true epilepsy following head injury, it has always been of the Jacksonian type. I think my experience has been too small, perhaps, to make a definite statement about the matter of epilepsy. In the cases brought into court, there is no question but what a thorough investigation should be made of the family and antecedents to prevent concealing a history of previous epilepsy.

Since writing this paper, and within the last two months, I have helped take care of a woman who was injured in St. Paul, and who was in a state of unconsciousness for fifty-two days, and finally died of pneumonia. She was brought into the hospital with a respiratory rate of four per minute, and a pulse in the fifties, and in profound shock. We decided on a spinal puncture and drained off 60 c.c. of bloody fluid. She improved following the first puncture and we continued these. After some days of bloody fluid, it began to clear, going through the characteristic changes, and the woman seemed on the road to recovery. She never got beyond a certain point, however. Her eyes were open and she would take food, but she knew nothing of what was going on around her. Those of us who were seeing the patient right along advised against opening the head, but her husband had friends who were very insistent upon it. We did not yield, however, and at autopsy our judgment was proven correct. The skull was opened and she had no clots of any kind, intracranially, but the right cortex was very badly lacerated, and had she lived, of course, she would never have regained normal mentality. In this case we were fortunate, at autopsy, in getting the evidence which proved that the proper therapy had been used.

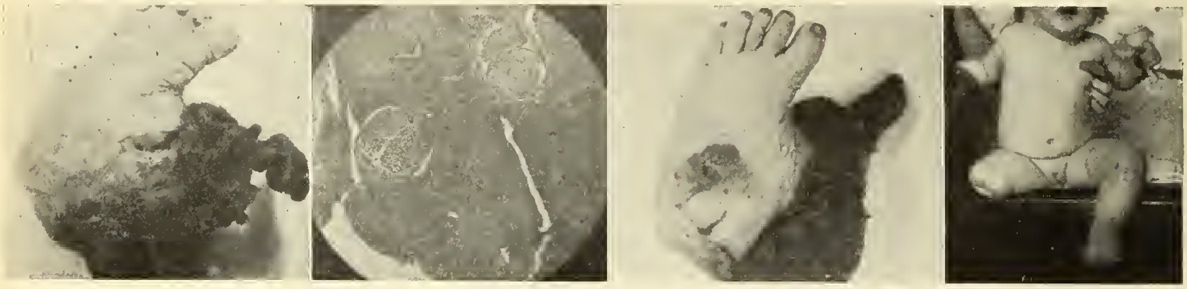

a b c d

Fig. 1

Dr. H. P. Ritchie (St. Paul) gave the following three case reports:

1. A Case of Prenatal Sarcoma.
2. Multiple Congenital Clefts of the Face.
3. A Transplant of the Female Breast.

I have three cases which I believe are worthy of our permanent records.

Case 1 is that of a baby born on June 20, 1929, at Pine City, Minnesota, under the care of Dr. Stratte. There is nothing in the family history that would have any bearing on the case. The carrying period was normal; the confinement was normal. Subsequent to birth, Dr. Stratte remembered that the amniotic fluid as it was evacuated was distinctly bloody, but this was not noted at the time for obvious reasons. The baby was born white with a large outgrowing spongy, bleeding tumor which involved the right heel and foot. A tourniquet was placed on the leg and as soon as the mother was cared for the baby was transported to the Children's Hospital in St. Paul, where it arrived about two hours after birth. Dr. Ray Shannon saw the case appreciated the critical situation and transfused with the father's blood. Blood count, hemoglobin 48, reds 1,790,000, blood grouping IV. I was called in to pass upon the possibility of surgical procedures other than amputation. The indication for this operation appeared imperative. After another transfusion, the leg was amputated in the lower third at the fifth hour of the baby's life. The specimen was given to Dr. Kano Ikeda, who made many sections of this tumor. Figure 1b is a photomicrograph of but one of several sections made. It shows a densely cellular tumor with nerve fibers, greatly enlarged, running throughout. Dr. Ikeda's report, copied from the history, is as follows:

> "A soft fungoid mass about 6 cm. in diameter protrudes out of the tibial aspect of the right foot and along the inner surface of the ankle. The surface of the mass is rounded and devoid of skin. The plantar aspect of the mass is irregular and broken. The cut surface shows a soft whitish cellular tissue with areas of hemorrhage. The tumor tissue infiltrates diffusely through the soft tissue of the tarsal portion of the foot. The aspect of the os calcis appears broken through by the tumor growth, while a cordlike trunk 1 cm. in diameter is present along the course of the tendo achillis. The tumor is composed of compactly arranged bundles of large pale staining spindle cells running in all directions. Many mitotic figures are noted. Diagnosis: Spindle-cell sarcoma."

Examination of the gross specimen showed that the amputation was through or so near to the tumor that, should the baby live, recurrence would surely follow. The tumor had extended, pushing aside the neighboring tissue alongside the tendon of Achilles up into the leg. The father was frankly told that the operation was unsatisfactory and incomplete. Re-amputation assumed the aspect of a moral problem. Was it justifiable to further mutilate this infant in the presence of such an active malignant growth? I decided to be influenced by the solution of two questions. Had metastasis already taken place? *X*-ray studies of the lungs were made and were negative. The question of icterus was run down and its presence disproven. The second question was whether the new growth was primarily an osteogenetic tumor? Rightly or wrongly, I have carried in my head the idea that primary bone tumors of the sarcomatous type were eventually lethal. The few cases which have come under the care of Dr. MacLaren, Dr.

Daugherty and myself are all dead, no matter what the point of amputation. The bones of the foot were found to be involved. This question was carefully considered by Dr. Bell and Dr. Ikeda with the conclusion that they were secondarily and not primarily involved. The father was most understanding and coöperative, and I received permisison to re-amputate. The point of amputation received consideration as to whether it should be undertaken in the leg or above the knee. I finally decided that the question was critical and so amputated on the fifth day of the baby's life in the lower third of the femur. The baby was bundled up and taken from the operating table back to its mother in Pine City. Under the care of Dr. Stratte this baby has now developed into a husky beautiful child, fourteen months old at the time of taking the picture in Figure 1d.

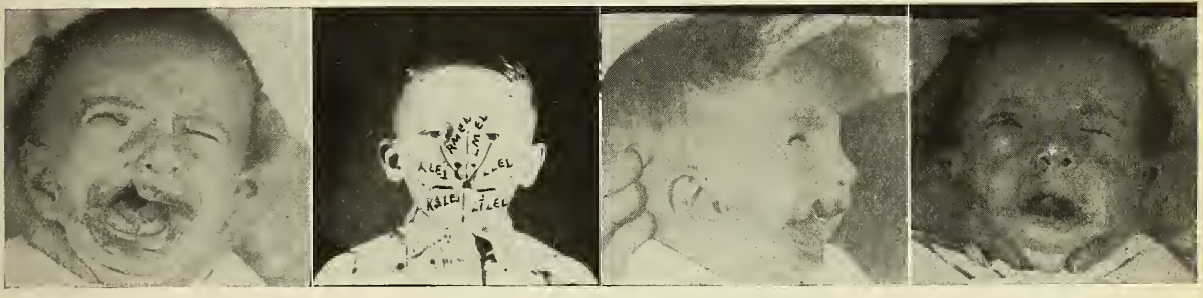

a b c d

Fig. 2

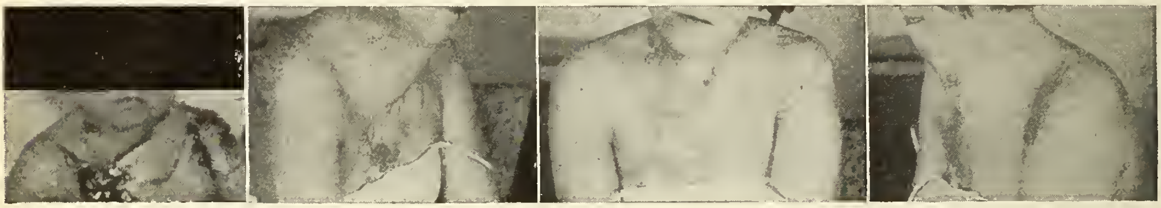
The value of this case from a surgical standpoint is nothing. These cases must be very rare, but we have not made a complete survey of the literature in this respect. Possibly there are many cases which have not reached the literature. From an embryonal standpoint it is interesting to speculate upon the cause of such a luxuriant growth developing to such a point in utero. It may have some bearing upon the theories of the formation of new growths. I presume from a pathological aspect the proper procedure will be to send all this data to the Sarcoma Commission for further consideration. From a clinical standpoint, the circumstances and problems of this case were as dramatic as in any of my recent experience.

Case 2 is a baby now four months old which shows multiple congenital clefts of the face. In Figure 2a a cleft appears in the right upper lip, commonly described as "harelip"; also a cleft at the right angle of the mouth extending into the right cheek, and a cleft of the left angle of the mouth extending into the left cheek. In Chapter IX, Volume V of Lewis' System of Surgery, I have had the wonderful opportunity to review some of the problems in the field of congenital clefts of the face and jaw. As I read that chapter in cold print I am startled at the controversial tone of it, the indirect and uncertain language of several statements and the over-emphasis on certain parts of the technic. But there is one part which I believe may very well be greatly enlarged. Part II of the chapter is entitled "A Surgical Interpretation of the Embryology." This is the product of a study undertaken through the interested help of Professor R. H. Scammon with a definite purpose to relate the embryology of the upper face and jaw to the surgical problems of this locality. I am in no position to talk embryology. I am still uncertain as to how much of the data recognized as principles of growth is incontrovertibly established; how much of the evidence is due to the direct study in the human embryo; how much is indirect evidence taken from the lower animals and applied to the human embryo. There is, however, a general agreement that the face is formed by the contact, union, or coalescence of separately developing groups of embryonal tissue. In embryological terms these are called "processes." The mandibular processes form the lower jaw, the maxillary processes and the frontal-nasal processes form the upper jaw. In the effort to carry embryology to our clinical problems it seems to me that we should have a broader term of description of the embryonal groups, so as to include all elements, no matter whether it is skin, muscle or mucous membrane, or bone, or whatever kind of tissue, because there is here found all of the superficial tissues of the body and which at some time require surgical attack. In searching for a substitute term, the word "division" was selected as being broad enough to include all elements under consideration for surgical repair. In Figure 2b are marked lines and letters inserted upon a photograph of a bilateral cleft lip. This particular case was selected because the clefts are exactly symmetrical; thus the prolabium of the median embryonal division is beautifully outlined. It is necessary to follow this figure while reading the description.

The lower jaw is formed by the union of the mandibular processes, here described as the right and left inferior lateral embryonal divisions. Should there occur a failure of union of these two divisions, a cleft will result. This cleft must be a median cleft and is here represented by a straight line in the lower lip. The upper jaw has a right and left lateral embryonal division exactly similar to the lower jaw. A failure of union between the right or left superior lateral embryonal division and the right or left inferior lateral embryonal division will result in a cleft at the angle of the mouth, right or left. These clefts likewise must be straight lines because, as in the lower jaw, only two embryonal divisions are concerned in the union. Unlike the lower jaw, the upper jaw has a third division which is called "the median embryonal division," inserted in between the right and left laterals. Growth is further complicated by the fact that the division has two points of origin so that the right median embryonal division has a different origin from the left median embryonal division. For instance, the alar cartilage of the right nose has a separate origin and growth from that of the alar cartilage of the left nose. So it is perfectly possible to have a failure of proper union between the right and left median embryonal divisions. Should this occur there follows a cleft nose, a cleft columella, a median cleft in the prolabium and pre-maxilla. All of these tissues are derived from the median division. These clefts should be straight-line clefts for the reason that again only two divisions are involved. The common harelip or cleft lip is formed by the failure of the right superior lateral to unite with the right median, producing a right cleft; or the left median to heal with the left superior lateral, producing a left cleft; or both appear in the same case. These clefts are always definitely lateral because they appear to one side or the other of the median division and therefore should be in oblique planes. These latter clefts may also extend into the face and up to involve the lower eyelid on either side or both sides. Every human embryo that starts life may have any one or all of six possible clefts, as shown by noting the lines on the diagram.

A review of this case of multiple clefts reveals that the right superior lateral embryonal division is out of contact with both the inferior and median neighboring divisions. The obicularis of the lip, on the superior right, which stands out definitely as bunched muscle, is entirely out of contact. It has failed to unite with the right inferior muscle and the cleft in the cheek results. It has failed to migrate underneath the skin of the prolabium to come in contact with the muscle which has normally migrated from the left lateral, and a harelip results. There is a suggestion of a cleft continuing from that of the lower lip up through the face to a small but appreciable angle in the lower lid. There is also a dermoid of the right eye.

The surgical indications are beautifully outlined and indicate that repair should be made on the muscle principle. In my series I have a cleft nose, I have seen illustrated the cleft columella, I have two perfect median clefts of the prolabium, I have many cases of harelip, both unilateral and bilateral, I have seen illustrated a cleft of the lower lip, and here is a case with the clefts at each angle of the mouth; thus all the lines drawn on the diagram have been clinically demonstrated. Whether or not the surgical interpretation of the embryology can be supported in detail, the statements here made, taken merely as a theory, fit into so many conditions that I believe they are worthy of mature consideration.



a b c d

Fig. 3

Case 3 is one to which I call your particular attention. In 1918, a girl five years old was brought to Dr. MacLaren, Dr. Daugherty and myself, suffering from a burn contracture of the neck, of a degree in which the chin was anchored to the manubrium. Two double-ended flaps were outlined—one on the right chest and one on the left shoulder and arm. The distal ends were gradually severed and when freed were placed in the form of a cravat on the denuded area which followed the dissection of the contractures of the neck. There is no picture of the original condition; indeed, one may not have been taken. We were not so careful of pictorial records then as we are today. Figure 3a is a photograph of the girl as she left the hospital and from this it will be seen that the flap from the right chest was placed at the chin and that from the left shoulder at the manubrium. Nothing was heard of the girl except an occasional indirect report that the operations were satisfactory.

On July 15, 1930, the girl with her mother appeared at my office. She had grown into a husky young lady, a junior in high school. She gave a history that everything was well until about four years previously, when the neck began to show gradual and progressive enlargement. Figure 3b is a photograph of the right side showing the very full, rounded neck and also the scar on the right chest. She wore a black band about her neck. When this was removed I was startled to see a well-developed mature nipple in the suture line shown in the front view (Fig. 3c) and left side of the neck (Fig. 3d) in which the nipple is more definitely shown. It is interesting to note that the enlargement had extended underneath the tissue of the left flap, which is very well outlined in this photograph. It took me quite a time to determine the situation. Palpation of the neck revealed a definite organized body under the skin and movable on the deep structures. Evidently in the first operation we were more concerned about the length of the flap and the fitting of it into the raw surface than we were in the tissues contained therein and had unwittingly included the immature infantile breast in the flap and had perfectly encircled the whole nipple and mammary gland leading into it. When puberty occurred this gland developed normal physiological enlargement.

The surgical problem was first, the question of replacement of the gland to its normal location. I knew of the elaborate procedures necessary to obtain tissue to substitute this beautifully placed flap and the time required to do so. The thing that decided me was the question of whether this gland was really a functionating structure and whether it would pursue its normal course should it be replaced. I finally decided to remove it. The next day a half-moon incision was made to remove the nipple, the tissues of the left flap were reflected backwards and a line of cleavage underneath this growth was then determined. At one time during the operation I had the identical picture of an ordinary mastectomy; the only difference being that the base structures were those of the neck instead of the pectorals. The usual care of dissecting the skin to prevent buttonholing and consequent scar was exactly the same. Figure 4a shows the mass removed with the nipple at the lower part of the specimen. Unfortunately this photograph was taken after it had been in a preservative, but it gives the ordinary picture en masse of the normal breast. Figure 4b shows the growth bisected; the size, the contour and the consistency illustrates a familiar picture. Figure 4c is a photomicrograph taken at random showing the regularity of the acini lined with deeply-staining cells and, although the interstitial tissue may be exaggerated, it surely has the picture of a normal breast.

The clinical value of this case, of course, is nothing. I cannot imagine a situation that would require the purposeful transplant of a female breast, but as a case bearing upon some of the questions and principles of tissue transference, it may be of great value. The recent literature upon the subject of transplants indicates that there is a more general recognition of the fact that the free-graft principle of transference is entirely different from that of the flap. The cellular structures of a flap, properly prepared and placed, are always live elements nourished by channels of supply approximately the same as when in their original position and the margin of chance is very broad that these structures will pursue in the new location their normal growth, physiological action and anatomical change, almost exactly similar to their behavior before the surgical attack. Quite contrary consideration must be made of the elements of a free graft. The normal bed of this tissue is completely severed and a new field invaded. Anatomical structure must be maintained by the formation of entirely new avenues of nourishment. The margin of failure is enormously widened unless meticulous care is exercised to obtain the most favorable conditions for the formation of new sources of nourishment and the physiological life of these cells revived at the earliest moment or anatomical death results and a failure of the surgical purpose follows. The behavior of the tissues of a free graft, of whatever nature, is by no means settled. There is a great question how many of the original cells revive and follow through their normal growth, how many are substituted by scar tissue, how much of a so-called successful result of a free graft is really due to growth of the original tissue, and how much is due to the possible stimulation of growth of other tissue.

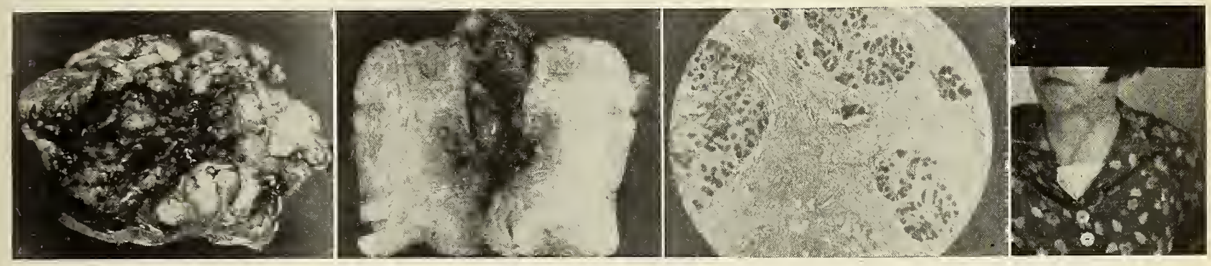

a b c d

Fig. 4

There is one division of this subject, however, where these considerations have been entirely disregarded, *viz.*, the transplant of glands. From a surgical standpoint the claims made for these procedures have exceeded the possibility of tissue transference. Glands have a complicated anatomical structure. They have intricate physiological function, depend for their activity upon direct arterial blood supply, and have a definite system of absorption. We are told that these are all severed and, on the principle of a free graft, these tissues are then placed in another location with the expectation that this complicated anatomical arrangement will be maintained and the physiological action restored. Indeed, it is suggested that the glands be placed in muscles, that the outer surfaces be scarified in the hope of obtaining new channels of nourishment; but when looked at from the principle of free graft and the flap, it seems to me that a gland so transferred can only have temporary effect, must either degenerate or become encysted as a foreign body, and that the clinical results reported following such procedures must be, in the main, psychological.

The mammary gland is the least complicated of any, but if it had been completely severed from its attachment and placed in the neck or elsewhere it would not have given the picture here shown. In this case the mammary gland was at no time severed from its original blood supply. Possibly some part of it may have been cut away, but at all times it has been living tissue, and during the years new channels have had time to form and consequently when puberty took place we see physiological enlargement. The explanation of its growth in this case appears logical and reasonable and I believe that this gland would have been activated in its odd position by pregnancy.

There is a chance for some one to make complete revision of the whole field based upon the physiology of the cell or groups of cells included in the transplant.

Dr. Arthur W. Ide (St. Paul) reported the following case of Prenatal Sarcoma, and the baby patient was presented before the Academy.

The patient (Baby B.), a girl, is now 35 days old. She was born in the Northern Pacific Hospital, St. Paul, Dr. H. G. Collie attending.

At birth a tumor was seen involving the left leg. This growth measured 16½ cm. in length and 23½ cm. in circumference. It was situated on the anterior surface of the knee and extended upward onto the anterior surface of the thigh and downward on the anterior surface of the leg. There was a small ulcer on the anterior surface of the tumor. General examination showed the baby to be normal except for this tumor. She weighed 7 pounds 12 ounces at birth.

Family History: The parents are both living and are strong and healthy. They have one other child, a boy three and a half years old, who is perfectly normal, well and strong. There is no history of syphilis, rheumatism, gout, tuberculosis, epilepsy or malignant disease The paternal grandmother died of Hodgkin's disease.

The patient has been at home and cared for by the mother except for the first ten days of her life. She now weighs 7 pounds 8 ounces—four ounces less than her weight at birth.

The tumor has not enlarged since birth. The ulcer on the anterior surface of the tumor has extended. It is now 2.5 cm. in diameter.

Diagnosis: The patient was seen by Dr. E. T. Bell, who considered the tumor to be a sarcoma.

It is very probable that the growth is malignant. The *x*-ray indicates that the bone is not the primary seat of the growth. It is firm in consistency. A biopsy so far has not seemed justifiable and for this reason we cannot state definitely the nature of the growth.

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

VIOSTEROL

Holtz and Schreiber of Göttingen have reached the conclusion that irradiation of ergosterol produces a number of distinct substances. One is the antirachitic factor, perhaps Vitamin D proper; another is a separate component producing calcification. The two effects, antirachitic and toxic, can be separated; or at least one can be destroyed while the other remains intact. If these observations prove to be correct, they may lead to a desirable purification of viosterol so as to eliminate or diminish the "toxic" features of its action. (Jour. A. M. A., November 22, 1930, p. 1593.)

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of November 6, 1930

Dr. A. T. Mann, President, presiding.

The regular monthly meeting of the Minneapolis Surgical Society was held in the Lounge of the Hennepin County Medical Society, on Thursday evening, November 6, 1930. The meeting was called to order at 8 p. m. by the President, Dr. A. T. Mann. There were 26 members and 6 visitors present.

On account of the length of the program, the reading of the minutes of the October meeting was omitted.

The scientific program was as follows:

Dr. John Rishmiller presented a case report on "Habitual Dislocation of the Shoulder, and the Clearmont Operation," with a general discussion of shoulder joint injuries. (To be published later in the International Jour. of Med. & Surg. and the Surgical Journal.)

Drs. L. H. Fowler and Wm. A. Hanson gave the following report of a case of "Embolic Gangrene of the Foot," the report being read by Dr. Hanson, after which the patient was presented.

The patient was a man aged 54 years, whose past history was essentially negative. On February 4, 1930, he had severe sharp pains in the arms, back and chest, at the level of the nipple line, which were not related to exercise. He had many carious teeth with recession of the gums, gingivitis and pyorrhea. Examination was otherwise negative.

On February 22, 1930, he had six lower teeth extracted, with no reaction following. On May 20, 1930, he had six upper teeth extracted, one surgically, with curettement of the sockets. On May 22, 1930, he began to have sharp pains over the chest of a stabbing character, with clonic contractions of the neck, chest and arm muscles. Six days later he had an increase in temperature to 101°, pulse 95. At this time he complained of pain over the dorsum of the right foot between the large and second toes. There was a small abrasion with an erythema about this area. He had marked hyperesthesia over the dorsum of the foot extending to the outer surface of the ankle. On May 31st he developed a temperature of 103° with a serosanguinous bleb about 3 by 4 inches in diameter over the dorsum and lateral side of the foot. Also a similar bleb 1 by 1 inch appeared over the medial surface of the foot. The whole foot and leg below the knee became markedly swollen, red and indurated. The patient was very toxic, delirious, with a temperature of from 103° to 104° for several days. General supportive measures were instituted. The foot and leg were treated by elevation, hot packs, Ochsner's solution for 24 hours, and then continuous irrigation with Dakin's solution. His general condition gradually improved. The cellulitis of the foot and leg cleared up. The skin and subcutaneous tissue of the dorsum and the lateral surface of the foot sloughed away, exposing the extensor tendons. Eventually, clean healthy granulation tissue appeared over this area.

On June 24, 1930, a full thickness skin graft was done. This was not successful, probably owing to the impaired blood supply to the part. Later, Thiersch grafts were applied with very satisfactory functional and cosmetic results. The patient has a practically normal foot today.

Careful examinations by medical consultants have failed to disclose any pathology in the heart or lungs. All laboratory examinations, including urine, blood, blood culture, *x*-ray, and electrocardiogram were negative.

The pathological process was apparently due to a blocking of some of the smaller terminal vessels of the dorsalis pedis artery by infective or bacterial emboli originating from infection around the teeth.

DISCUSSION

Dr. L. H. Fowler stated that this was a "rapid-fire" fulminating condition. In February the patient had had no trouble following the extraction of six teeth which were pulled on account of marked infection of the gums around the teeth. Three months later he had six more teeth extracted, and in six days the acute chest condition developed, which was apparently due to showers of small pulmonary emboli. Two days later he developed the lesion on the dorsum of the foot, particularly localized at the base of the great toe. First there were blebs on the skin. Soon the whole foot became edematous, and extensive cellulitis developed extending practically up to the knee. Within four days the whole dorsum of the foot was gangrenous. Eventually the superficial tissues of the lateral side all sloughed off down to the extensor tendons. The skin on the medial side of the foot retained its vitality in spite of the subcutaneous tissues being necrotic and infected.

Dr. Fowler called attention to two or three interesting phases of the case. Surgically, it did not present such a difficult problem except combating the infection. Part of the skin grafts used followed Dr. Wangensteen's method of cutting the Thiersch grafts into small bits and burying them in the granulation tissue. They took, and there is practically no difference today between those and the other areas where whole Thiersch grafts were applied.

Dr. Fowler said that the pathology in this case was interesting: How did these emboli get there? The gangrene was localized to the distribution of the arcuate artery, a terminal branch of the dorsalis pedis, and must have been due to an infective embolic process. He stated further that he had found very little in the literature on this subject; only one case in recent years and that was a case of gangrene of the toes following tonsillectomy and reported in 1929 by Wright, which was associated with a subacute bacterial endocarditis. Dr. Fowler's patient never had any signs of a heart lesion. Pathologists say that very rarely emboli follow operations on the head and neck.

The speaker felt that the only logical explanation for this case just reported was that it was due to a bacteremia coming from the infected teeth, with the bacterial emboli lodging in these terminal vessels and causing the gangrene.

Dr. E. A. Regnier asked how Dr. Fowler accounted for the chest pains?

Dr. Fowler thought this was due to showers of small pulmonary emboli, and added that the patient had had four or five attacks of these sudden severe pains in the chest since he had been at home, but at no time had there been any definite findings in the lungs or in the heart.

Dr. R. C. Webb asked if an electrocardiogram had been taken.

Dr. Hanson stated that an internist had gone over the heart very carefully and there had been *x*-rays and electrocardiograms taken, all of which were negative. He also added that at no time were the toes or sole of the foot involved.

Dr. J. M. Hayes stated that he had been using the so-called Ochsner (or modified Ochsner) method of treating infections of the extremities for many years; and he knew of no one who had ever used it properly, going back to the old method of using plain hot packs for this purpose. Dr. Hayes felt that there was no doubt of its superiority over the use of the ordinary hot pack.

Many years ago Dr. Ochsner had observed this dressing used with saturated boric acid alone and the results were so satisfactory that he was led to do some experimenting with it. He observed that boric acid appeared in the urine after this dressing had been on a few hours. Taking bacteria from the wound before the pack was applied, and injecting them into the peritoneal cavity of a guinea pig, caused the death of the guinea pig in 24 hours. After this dressing had been on for 48 hours, bacteria from the same wound injected into the peritoneal cavity of a guinea pig failed to cause any disturbance.

Dr. Hayes stated that he and his associates had also carried out some of these experiments and obtained the same results. He added that, although the boric acid alone gave good results, he found that the addition of alcohol and phenol added to the efficiency of the solution. He called attention to the fact that several different solutions have been called "Ochsner's solution," and for that reason the one he used was referred to as "modified Ochsner's solution." The solution accredited to Ochsner in some dictionaries would cause a slough in 48 hours, but the "modified Ochsner's solution" would never cause a slough in 48 hours.

Dr. Hayes believed that the reason this treatment had not become more popular was because the technic of applying it was not carefully adhered to, and that this was very essential in order to obtain the desired results. He said that the pack must be large, consisting of a thick layer of gauze over the skin, then a thick layer of good absorbent cotton, and an outside covering of rubber, making the whole dressing as nearly air-tight as possible. This dressing should not be disturbed for 48 hours except for the solution poured on two or three times a day through a small opening in the least dependent portion of the dressing. The solution Dr. Hayes now uses is: boric acid, saturated solution ounces 28, alcohol ounces 4, and phenol drams 1. The dressing must be kept thoroughly saturated with the solution.

Dr. Hayes called attention to the enthusiasm of some of those who have recently gone out from the University, over this method of treating these wounds, and their satisfaction in getting these patients back to work so much more rapidly than by other methods.

Dr. A. A. Zierold asked if Dr. Fowler's patient had gangrene before or after the application of the Ochsner's solution.

Dr. Hayes replied that there was a thrombosis present and evidence of a slough before the dressing was put on. This dressing will never give a slough in 48 hours.

Dr. Owen Wangensteen stated that Dr. Hayes may be perfectly right about the use of this solution. He called attention to the fact that when Dr. Hayes began injecting varicose veins others were amused over it but that it was now a universally practised procedure. He said that in the treatment of acute infections there are essentially two factors of primary importance: one is absolute rest, and the other increase of heat in the affected part. Nature does this in part by increasing the temperature locally. He wondered if water poured into the dressing as used by Dr. Hayes would not accomplish the same result, and called attention to the fact that a 1 per cent solution of phenol might cause gangrene in the terminal digits. However, he had seen patients treated by this method and had observed some of the good results which Dr. Hayes had obtained. He said he would like to see Dr. Hayes run a control series of these cases at the University Hospital, using hot water in the pack instead of the Ochsner's solution.

Dr. Hayes stated that no doubt the method of applying the dressing was an important factor and that fair results were obtained with boric acid or even with sterile water, but he had tried these many times. When the infection was severe this was not enough. After trying several solutions the one given above was found to be the most efficacious and, if properly applied, will not fail to localize any infection of the extremity in 48 hours. The suggestion of having some beds for this work in the hospital would be a most acceptable proposition.

Dr. William P. Herbst stated that it is an interesting fact that boric acid has been demonstrated in the urine 55 seconds after immersion of the foot in a tub of boric acid solution, even when the skin is unbroken. (Ref: Kahlenberg, L., Jour. Biol. Chem., 1924-25, lxii, 149, p. 405.)

(The patient was then shown and attention called to the location of the grafts and the excellent result obtained in this case.)

Dr. Thos. J. Kinsella of Glen Lake then read his inaugural thesis entitled "Phrenicotomy for Pulmonary Tuberculosis." This was illustrated with numerous lantern slides showing the condition of the lungs before and after operation.

An Eastman film on "Prostatic Hypertrophy" was shown after the reading of the papers. This proved to be an enjoyable feature of the scientific program and it is hoped that arrangements may be made to have similar films shown at future meetings of the Society.

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

PROCEEDINGS OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of October 9, 1930

The regular meeting of the Minneapolis Clinical Club was held in the Hennepin County Medical Society Rooms, Thursday, October 9, 1930. Dinner was served at 6 o'clock and at 7 o'clock the business meeting was called to order by the president, Dr. Moses Barron. Minutes of the preceding meeting were read by the secretary and approved as read. After the regular business of the evening, the scientific program was given. It is as follows:

Dr. J. M. Lajoie read a paper on "Cardiac Emergencies" (to be published in Minnesota Medicine at a later date).

Dr. W. A. Fansler followed with a report of "Two Unusual Rectal Cases"; one of "Tuberculous Intestinal Fistula," and one of "Ischiorectal Abscess with Pneumonia."

The first case I wish to report is that of a female, married, thirty-two years old. Her history is unimportant except an operation for chronic appendicitis two years ago. Two months previous to my seeing her she began to complain of pain in the rectum and had an afternoon temperature of about 99.6. Complete physical examination with x-ray of chest, gastro-intestinal tract, blood examiantion and tuberculin reactions were negative. The only symptoms were a rapid pulse, about 110, slight afternoon elevation of temperature and nervousness. One month after the initial onset of symptoms a small mass about 4 cm. across was felt in the left rectal wall about two inches above the ano-rectal juncture. This was opened through the rectum but did not heal and was opened more widely ten days later. She did not improve and I was asked to see her two weeks after the second operation or two months after the onset of rectal pain.

Upon proctoscopic examination nothing could be seen externally. Internally an opening could be seen in the bowel wall about two inches above the ano-rectal junction above the insertion of the levator ani muscles. A probe revealed a cavity almost two inches deep and extending downwards along the bowel wall below the level of the opening of the abscess cavity with the rectum. The appearance of the lesion gave the impression that it was probably tuberculous. Under caudal anesthesia the opening was enlarged and carried down far enough so that adequate drainage from the lowest portion of the cavity was secured and all granulations were curetted out. These were examined by University pathologist and reported as being the product of simple chronic inflammation. The lesion still did not heal as rapidly as was desired and six weeks later a more radical procedure was done with the actual cautery. The tissue was again sent to the University and a report of chronic inflammation returned. Not satisfied with this report, the remaining tissue was sent to the Glen Lake Sanatorium, where serial sections were run and definite tubercle formation found. About this time I saw an out-of-town surgeon who had operated upon her two years previous and was told that at the time of operation he had found a tuberculous peritonitis with many miliary tubercles, the pelvis being especially involved. The patient was seen daily for almost nine months. The lesion was dressed daily and upon three occasions areas were cauterized at my office with the actual cautery. At the end of this time there was complete healing. It is quite possible that this fistula might have been healed more quickly if the incision had been carried down through both sphincters and well out into the ischiorectal fossa, thus converting the sinus into an open V-shaped cut. In doing this, however, sphincteric control would have been sacrificed and under the circumstances restoration of the sphincter by secondary operation might have been unusually difficult. I have cared for many cases of tuberculous fistulæ but I have never seen this type. To me it brought out two very interesting things: First, that a few microscopic sections, when negative, are of little value in the diagnosis of tuberculosis. In doubtful cases serial sections should be made. Second, it has again emphasized the value of the actual cautery in treating tuberculous lesions about the rectum. I use the cautery routinely in operating rectal fistulæ but its repeated use to encourage healing of sluggish areas, to me is new and the results encouraging.

The second case I wish to report is much more dramatic. I was called on the long distance phone and told that a patient was suffering from rectal pain and that he was being brought to Minneapolis that afternoon. Upon arrival his local physician gave the following history: The patient was a male, thirty-seven years old. His only previous history was that of an apical tuberculosis two years previously for which he was in a sanatorium for about three months. Since then his weight has been up and he has enjoyed good health. Two weeks previously he had injured his foot while playing golf, apparently an abrasion from his shoe. This was quite sore and a few days later he complained of pain in the rectum and some soreness in the right groin. His temperature was 101. Rectal examination revealed a tender spot just to the left of the prostate but no induration or swelling could be made out. He was kept quiet for a few days, the foot dressed and warm water enemas given. Under this he seemed to improve and returned to work. Three days later he called his local doctor at 2 a. m., because of the severe pain. The findings were the same as before except the pain in the rectum was so severe that one-fourth grain of morphine hypodermatically did not give complete relief and the temperature was again 101. Late that afternoon he was brought to me at Northwestern Hospital. When I saw him about 5 p. m., his temperature was 104.6, respirations were thirty and there was a slight degree of cyanosis. The glands in the right groin were palpable and tender. Rectal examination revealed a moderately tender area (on deep pressure) about 2 cm. in diameter and directly to the left of the upper portion of the prostate. No induration, fluctuation or other abnormality could be felt and the rectal mucosa over the tender area was normal in appearance. A blood culture was ordered. I felt certain that the symptoms were out of line with the rectal findings and asked for consultation. The leukocytes were 18,000, a moderate anemia present. *X*-ray of the chest showed a diffuse bronchial pneumonia. Blood culture revealed staphylococci and a gram-negative diplococcus in the blood stream. His condition became progressively worse and he died the morning of the fourth day after admission to the hospital.

Autopsy was obtained. The pleural cavity contained about 800 c.c. of cloudy yellowish fluid and many fresh fibrous adhesions. The pericardial sac contained fibrin threads in cloudy serous fluid. The heart was soft and flabby and contained multiple petechial hemorrhages.

The left lung showed old fibrous adhesions at the apex. Each lung showed similar findings. The pleura was covered with a thick fibrous membrane nodular in character. On section some of the nodules were seen to be infarcts; others were abscesses.

The left ischiorectal fossa contained an abscess the size of a small walnut and did not perforate the levator ani. A definite inflammatory process could be seen extending upward to the left inguinal region.

The diagnosis then was: (1) Ischiorectal abscess; (2) septicemia; (3) bronchopneumonia, bilateral with abscess formation; (4) cloudy swelling of the heart, liver, kidneys.

The history and antemortem findings in this case are to me interesting. In the first place it would seem that the original site of infection was in the foot. The second localized site where the infection struck was in the left ischiorectal fossa and inguinal glands, whether through the blood stream or lymphatics cannot be told. If through the lymphatics, then drainage of the ischiorectal fossa at the first onset of rectal symptoms might have been of benefit. At the time he was admitted to the hospital here I do not believe it would have been of value. The second interesting feature is the findings on rectal examination. The examination was absolutely negative except for the spot of tenderness. In every case I have examined previously there has been some induration or some difference in the consistency, size, shape or excursion between the normal and involved fossæ.

It is my custom to open every perirectal abscess the moment a diagnosis is made and in the past I have been able to make a diagnosis at once. In this case I was unable to tell whether an abscess was present or not and even had the patient's general condition been better I should not have felt justified in operating without further observation. This adds, then, one more point to our fund of knowledge. It may be possible to have a perirectal abscess without anatomical change demonstrable by palpation. Pain, tenderness and temperature alone may be enough to justify exploration.

DISCUSSION

Dr. LaVake: This case is very interesting to me. We find in gynecology that unless there is the definite indication for drainage—fluctuation—we almost invariably get into difficulty if we incise. Again and again in my early practice I would be overweighed by consultants in favor of draining an indurated area. In many instances I felt convinced that it spread the infection and in may instances the incision healed and fluctuation nearby required further incision. I believe this case was handled perfectly. The man likely had a positive blood culture when he was first seen.

Dr. McCartney: Dr. Fansler's point is well taken on the point of serial sections. I do not know whether it is always possible to run serial sections; however, it depends upon the size of the piece of tissue. Some little time ago we were asked to run serial sections on a whole kidney. We figured that it would cost $3,000.00 and a girl's time for a year to do this. It is perfectly true, too, that you may get the thing you are looking for in the first section, and then again you may not. We get pieces of tissue every now and again, where they are thinking of tumor, and yet multiple sections do not show any sign of the disease condition present in the piece submitted.

Dr. Fansler (closing): I do not believe that draining this abscess would have made any difference in the outcome. Possibly if I had seen him two or three days earlier, I might have felt justified in exploring the ischiorectal fossa. If I had seen him before his pulmonary symptoms developed and had drained the abscess, it is still a question in my mind as to whether it might have prevented the pneumonia for most likely the blood stream infection was already present.

In answer to Dr. Wynne's question as to whether a subcutaneous tuberculin test had been done. I questioned the doctor especially about this. I have seen a large number of tuberculous fistulæ, and I was suspicious about this one. He said he had done a tuberculin test, rayed the chest and had all other laboratory data and could not find a thing.

In answer to Dr. Barron's question as to whether the doctor had watched the patient over a period of time. He said he had observed and examined this patient repeatedly, including numerous rectal examinations. I may also add that this physician is a very careful, keen and competent clinician. I believe the infection probably originated in the pelvis. We do know that tuberculous abscesses are almost painless to touch unless complicated by pyogenic organisms. This one could easily have developed painlessly and was in the beginning deeply enough seated that it could not be palpated.

Dr. Donald McCarthy presented two cases, (1) "Malignant Hypertension," and (2) "Diabetes with Substernal Thyroid."

The meeting adjourned at 8:30 P. M.

H. Bright Dornblaser, M. D.,
Secretary.

Meeting of November 13, 1930

The regular monthly meeting of the Minneapolis Clinical Club was held on Thursday evening, November 13, 1930, in the Lounge of the Hennepin County Medical Society. Dinner was served at 6 o'clock and the meeting was called to order shortly after 7 o'clock by the President, Dr. Moses Barron.

There were 28 members and 2 visitors present.

Minutes of the October meeting were read and approved.

After a short business meeting, the scientific program was taken up as follows:

Dr. A. A. Zierold reported a case of "Sympathectomy as a Cure for Angina Pectoris," and after the reading of the history the patient was presented to the Society. The case report is as follows:

This patient is a man 60 years of age who has been suffering for three years from anginal attacks of increasing severity and frequency. He has been under the care and observation of an internist and the clinical diagnosis of angina pectoris has been confirmed by repeated electrocardiograms. During the past few months the pain has been sufficient to require large doses of morphin regularly. As the patient exhibited no evidence of cardiac decompensation it was thought that, could he be relieved of pain, he might be restored to some degree of activity and usefulness.

It was decided to attempt the alcohol injection of the cervical and thoracic sympathetic ganglia as advocated by Mixter and White. Because of the deep layer of fat and muscle overlying the upper thoracic spine the original technic could not be followed. Under novocain infiltration anesthesia a five-inch incision was made caudally from the level of the seventh cervical spine, parallel to and two inches distant from the upper dorsal spinous processes. The incision was carried through the muscles to the ribs, exposing them at the articulations with the transverse processes. Beginning with the first rib, a needle was introduced under the lower border at this point and directed medially and upward to reach the site of the sympathetic ganglion without entering the pleura. It was then aspirated to confirm its location, and a few c.c. of 1 per cent novocain was injected. Five needles were placed after this manner under the borders of the upper five ribs. In each of these 5 c.c. of 80 per cent alcohol were injected. The patient experienced no pain or discomfort, but noted an anesthesia of the inner side of the left arm and the left chest wall corresponding to the distribution of the upper five thoracic nerves. On the following day this was replaced by a similar area of hyperesthesia which gradually disappeared in the following two weeks.

The patient's convalescence was uneventful. The wound healed promptly and in a normal manner. It is now four weeks since his operation and he has not experienced a single anginal pain.

You will note that as evidence of the interruption of the splanchnic pathways, the patient has the enophthalmos and constricted pupil of a Horner's syndrome. The left hand is also warmer than the right as a result of vasoconstrictor loss.

It is yet too early to warrant any positive statement, but it appears reasonable to believe that the patient will be free from pain for some time, if not permanently.

DISCUSSION

Dr. H. L. Ulrich: I am sorry I did not know this patient was coming this evening and I would have looked over my notes before the meeting. I saw this man in consultation three years ago. He had a distinct coronary closure from which he recovered and went about his work again. This year I saw him again and at that time he was in a state of persistent anginal attacks. I suggested that he be operated on and that the thoracic ganglia be injected. This is as far as I am acquainted with the patient. At the time I saw him first he had distinct coronary disease and now gives evidence of conorary disease in the electrocardiogram. He is entirely free from pain.

Dr. Archie H. Beard: I understand that the results of this injection have the tendency to disappear, and that in time the attacks of angina are apt to return. I have the impression that White's last report stated that at the end of about three years some were having anginal attacks.

Do you think that this was due to faulty technic at the time of the injection, and do you know whether the same results occur when you cut down the ganglia and inject them direct?

Dr. Zierold: It is probable that the percentage of unsatisfactory cases is in direct proportion to those which do not develop a Horner's syndrome as secondary evidence of successful injection.

Dr. J. C. Michael: Do you attempt to expose the ganglia?

Dr. Zierold: No.

Dr. Michael: One would not, of course, expect a return of function in those sympathetics?

Dr. Zierold: I assume that the ganglia will be destroyed or irreparably injured by the alcohol.

Dr. J. S. McCartney read a paper on "Cirrhosis of the Liver," illustrating it with numerous lantern slides. (Paper to be published later, probably in the Archives of Internal Medicine.)

DISCUSSION

Dr. H. L. Ulrich: I merely wish to emphasize that clinically I have been struck by the fact that in adults about 40 years of age, or over, when you find a pleural effusion that you cannot explain, it is well to look at the liver to see whether or not that patient has cirrhosis. The pleura may be the first cavity to show fluid.

The liver is a strange field, a strange organ. In the last few years we are getting reports that by injecting a pigment into one group of portal veins it comes up in one lobe of the liver, and by injecting another group it shows up on the other side of the liver. This differentiation of the blood in the portal vein is very strange. That is just one of the little mysterious points about the liver. And these plates we have seen tonight are not made any clearer by such knowledge, but it merely shows why they may be so confusing.

Great credit is due to Dr. McCartney for his persistent attempt to bring clearness to this subject. We should be very grateful to him for bringing so much order out of an apparent chaos.

Dr. Barron: This is the type of paper that can bear a great deal of discussion both from the clinical and pathological standpoints.

Dr. Frederick H. Schaaf gave a talk on "Hunting Big Game with a Movie Camera," and showed two reels of pictures taken on his recent hunting trip in Canada. This was a very enjoyable addition to the program.

The meeting adjourned.

H. Bright Dornblaser, M.D.,
Secretary.

NEW AND NON-OFFICIAL REMEDIES

The Council of Pharmacy has accepted the following articles:

Abbott Laboratories
- Gold Sodium Thiosulphate-Abbott

Eli Lilly & Co.
- Erysipelas Antistreptococcic Serum-Lilly (Concentrated Globulin)

Medical Arts Laboratory, Inc.
- Antirabic Vaccine, Semple Method

National Drug Co.
- Antipneumococcic Serum, Type I
- Ointment Scarlet Red Biebrich 8 Per Cent
- Typhoid-Paratyphoid A Vaccine

Parke, Davis & Co.
- Ventriculin

Richards Pharmacal Co., Inc.
- Richards Psyllium Seed

E. R. Squibb & Sons
- Diphtheria Toxoid-Squibb, twenty 1 c.c. ampule packages
- Diphtheria Toxoid-Squibb, two 1 c.c. ampule packages
- Normal Horse Serum, one 50 c.c. vial package
- Ragweed Pollen Allergen Solution-Squibb (3 vial treatment package)
- Timothy Pollen Allergen Solution-Squibb (3 vial treatment package)

TRUTH ABOUT MEDICINES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

McKesson's Vitamin Concentrate of Cod Liver Oil.—A cod liver oil concentrate having not less than eleven times the minimum Vitamin A potency of cod liver oil, U.S.P., and not less than eleven times the Vitamin D potency of a potent cod liver oil used as a standard. The product possesses properties similar to those of cod liver oil so far as these depend on the fat-soluble vitamin content of the latter. McKesson and Robbins, Inc., Bridgeport, Conn. (Jour. A. M. A., November 1, 1930, p. 1347.)

Maltine with Cod Liver Oil and Iron Iodide.—This product is composed of maltine, 70 per cent; cod liver oil, 30 per cent; and ferrous iodide, 0.44 Gm. per hundred c.c. (2 grains to each fluid ounce). Maltine is a preparation essentially similar to extract of malt, U.S.P., but it contains 3.8 per cent of alcohol, is prepared from malted barley, oats and wheat; its Vitamin B_1 and B_2 content and its starch converting power are controlled by assay. Maltine with cod liver oil and iron iodide contains in 100 c.c. from 23,000 to 25,000 Vitamin A units as determined by the U. S. Pharmacopeia assay and its Vitamin D potency is controlled by assay. Maltine Company, Brooklyn, N. Y.

Diphtheria Toxoid.—A diphtheria toxoid (New and

Non-official Remedies, 1930, p. 364), prepared from diphtheria toxin of which the L+ dose is 0.2 c.c. or less. The toxin is treated with formaldehyde and is tested for antigenic power. The finished product is adjusted to contain in 2 c.c. enough of the toxoid for one immunization treatment. It is marketed in packages of one immunization treatment. Lederle Laboratories, Inc., Pearl River, N. Y. (Jour. A. M. A., November 15, 1930, p. 1505).

Ampoule Sterile Solution Dextrose, U.S.P., 5 Gm., 10 c.c.—Each ampule contains dextrose, U.S.P., 5 Gm., in distilled water to make 10 c.c. E. S. Miller Laboratories, Inc., Los Angeles.

Ampoule Sterile Solution Dextrose, U.S.P., 10 Gm., 20 c.c.—Each ampule contains dextrose, U.S.P., 10 Gm., in distilled water to make 20 c.c. E. S. Miller Laboratories, Inc., Los Angeles.

Ampoule Sterile Solution Dextrose, U.S.P., 25 Gm., 50 c.c.—Each ampule contains dextrose, U.S.P., 25 Gm., in distilled water to make 50 c.c. E. S. Miller Laboratories, Inc., Los Angeles.

Dextrose (d-Glucose) Unbuffered and Without Preservative, 10 Gm., 20 c.c. Ampule.—Each ampule contains dextrose, U.S.P., 10 Gm., in distilled water to make 20 c.c. H. K. Mulford Co., Philadelphia.

Dextrose (d-Glucose) Unbuffered and Without Preservative, 25 Gm., 50 c.c. Ampule.—Each ampule contains dextrose, U.S.P., 25 Gm., in distilled water to make 50 c.c.; accompanied by an ampule of 2 c.c. of a buffer solution. H. K. Mulford Co., Philadelphia.

Dextrose (d-Glucose) Unbuffered and Without Preservative, 25 Gm., 50 c.c. Double End Vial.—Each double end vial contains dextrose, U.S.P., 25 Gm., in distilled water to make 50 c.c.; accompanied by an ampule of 2 c.c. of a buffer solution. H. K. Mulford Co., Philadelphia.

Dextrose (d-Glucose) Unbuffered and Without Preservative, 50 Gm., 100 c.c. Ampule.—Each ampule contains dextrose, U.S.P., 50 Gm., in distilled water to make 100 c.c.; accompanied by an ampule of 4 c.c. of a buffer solution. H. K. Mulford Co., Philadelphia.

Ventriculin.—Desiccated, defatted, hog stomach.—It is assayed clinically by observation of the reticulocyte response, the standard being an increase of red blood cells at the rate of about one hundred thousand cells per cubic millimeter per week when the product is administered to patients suffering from pernicious anemia. Stomach tissue of animals has been shown to contain a principle capable of stimulating the bone marrow to form immature red cells in large numbers. When, during the first ten to fifteen days treatment with ventriculin, a satisfactory rise in reticulocytes occurs, this is evidence that effective and progressive blood regeneration is taking place. Ventriculin is supplied in the form of a powder in vials containing 10 Gm. Parke, Davis & Co., Detroit. (Jour. A. M. A., November 22, 1930, p. 1589.)

Synephrin—Hydroxyphenylmethylaminoethanol Hydrochloride.—The hydrochloride of an alkaloid obtained synthetically. Synephrin is used as a vasoconstrictor. It is less toxic than either epinephrine or ephedrine, and its vasoconstrictor action, while not so pronounced as that of epinephrine, endures for a longer time. In combination with procaine hydrochloride it is useful for local anesthesia in dental operations and in minor surgery in cases in which a bloodless area is not required. The drug is also supplied in the form of Synephrin Solution "A," Ampoules Synephrin-Procaine, 3 c.c., and Hypodermic Tablets Synephrin-Procaine. Frederick Stearns & Co., Detroit.

Mead's Dextri-Maltose with Vitamin B.—A mixture containing approximately: maltose, 52.58 per cent; dextrine, 39.80 per cent; protein, 4.34 per cent; mineral salts, 2.28 per cent; and moisture, 1.00 per cent. It is standardized physiologically to contain in each 2.5 Gm. the Vitamin B_1 and B_2 equivalent of approximately 1 Gm. of dried yeast or 2 Gm. of wheat embryo. Mead's Dextri-Maltose with Vitamin B is proposed for use in the diet of infants suffering from Vitamin B deficiency. Mead Johnson & Co., Evansville, Ind. (Jour. A. M. A., May 3, 1930, p. 1405.)

Scillaren.—A mixture of the natural glucosides, scillaren-A and scillaren-B, occurring in fresh squill *Urginea maritima,* in the proportions in which they exist in the fresh crude drug; namely, about 2 parts of scillaren-A to 1 part of scillaren-B. Completely dried scillaren contains approximately 98 per cent of the active glucosides. Scillaren dried in a high vacuum at 78° C. for fifteen hours loses not more than 6 per cent of its weight. The cardiac action of scillaren is essentially similar to that of digitalis; but this action is apparently less persistent than that of digitalis. Scillaren is administered orally and is supplied in the form of tablets containing 0.8 mg. (1/80 grain) of scillaren and in the form of a solution containing 0.8 mg. (1/80 grain) of scillaren. Sandoz Chemical Works, Inc., New York.

Parke, Davis & Company's Codliver Oil with Viosterol 5 D.—A brand of codliver oil with viosterol 5 D.-N.N.R. (New and Non-official Remedies, 1930, p. 257). Parke, Davis & Co., Detroit. (Jour. A. M. A., May 31, 1930, p. 1761.)

CONSULTATION BUREAU

(Continued from page 92)

Answer.—If abortion is inevitable and there are strong pains without bleeding, the patient should be put to bed and nature allowed to take its course. If there is no possibility of avoiding the termination of pregnancy, and you are absolutely sure about this, and the process is lagging, stimulation of the uterus with quinine or pituitrin is indicated. If the patient is bleeding profusely a sterile pack may be inserted and removed before twelve hours. If the bleeding is excessive and cannot be controlled by a pack, the cervix should be dilated with a sponge forceps. In any event the patient should be kept in bed from five to seven days after delivery to allow involution to take place. Curettage should never be done even if the patient continues to bleed and material is present in the uterus until she has been free of fever for ten days and has a normal leukocyte count. If the patient is still having trouble (bleeding) and has been free of fever for ten days and has a normal leukocyte count, then a sponge forceps (sterile) should be introduced into the uterus with great precaution to avoid infection, and anything which is loose should be gently taken out.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg.
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

ORAL INFECTIONS AND THEIR RELATION TO DISEASES OF THE EYE: Henry Dunning (Arch. Ophthal., Sept., 1930, p. 315). Intestinal bacteria have a predilection for the pulp of teeth in which vitality is low. They find their way to the pulp of the teeth through the blood stream and cause the death of the teeth by their action.

Teeth become infected most often in the following three ways: (1) By the intradental route, in which the decay involves the pulp, then thepulp canal and goes onward through the apex of the tooth. This causes the true apical infection. (2) By the peridental route under the gingivæ, in which the peridental attachment into the alveolus is stripped up, thereby allowing bacteria to gain access to the bone. (3) Through the blood stream.

Pus under pressure, locked in a spongy vascular bone, gives no trouble for years, but continuously and relentlessly breaks down the patient's resistance until the chemistry of the body has undergone certain changes. Secondary changes then take place in the blood and perhaps all other tissues, including the eye.

For culturing organisms the tooth must be extracted under local anesthesia, as general anesthesia allows the socket to become contaminated with the increased flow of saliva and increased bleeding of the adjacent parts.

The question of pulpless teeth has not been settled as yet by the dental profession although the prevailing opinion is that nearly all pulpless teeth are infected and that most of them can not be made safe for the patients who are carrying them. Most pulpless teeth ought to be removed in a patient of about 50 years of age in order to reduce to a minimum the number of virulent bacteria, with their toxins, which are present in the body, just as it is a correct procedure to cut down to a minimum the number of bacteria in the milk or other food that one is to consume.

Furthermore it is poor practice to curet infected alveoli of teeth after extraction as it has taken many months to build up a barrier around the tooth and this should not be broken down, allowing the organism at the apex of the tooth to have free access into the walls of the newly formed wound. It is possible by this procedure to let loose into the system many dangerous bacteria and their toxins.

Carefully observed cases of orbital abscess, iritis, and uveitis that can be definitely ascribed to dental sepsis, have been recognized and described. While the exact process of extension is not known, yet the improvement of these eye conditions following the correction of the disease of the teeth is sufficient evidence that a close relationship exists.

The mode of transmission is probably in one of these three ways:

(1) Direct extension through bone.

(2) Direct extension along the periosteum of the malar bone.

(3) Blood stream (the most important).

The literature and case reports repeat over and over the evidence that infections of the mouth play an important rôle in connection with ophthalmic disease.

GERALD M. KOEPCKE, M.D.

PEDIATRICS

DEFECT OF THE DICK TEST AND ITS REMEDY: T. Toyoda and Y. Futagi (Jour. Infect. Diseases, 46-196, March, 1930). Toyoda and Futagi conclude that the Dick toxin consists of two toxins one of which is heat-labile and the other is heat-stable. The heat-labile toxin, which they consider to cause the symptoms of scarlet fever in its early stage, contains no nitrogen, and is easily destroyed in one half hour at 80° C. This heat-labile component of the Dick toxin gives strongly positive cutaneous reactions in individuals who are not immune to scarlet fever, and never causes allergic reactions. The heat-stable toxin, on the contrary, is not destroyed in two hours at 100° C., and when employed in skin tests often produces allergic reactions in those immunized against scarlet fever, which may account for the failure of the studies of various investigators to coincide with one another. Toyoda and Futagi feel, therefore, that in performing Dick tests one should use only the pure heat-labile toxin, and that skin reaction to this toxin accurately indicates susceptibility or immunity to scarlet fever.

C. A. Stewart, M.D.

CHOREA: A. E. Vipond, M.D., Montreal (Arch. of Ped., October, 1930, Vol. XLVII, No. 10). Chorea is due to a toxemia of the brain and spinal cord. This produces an irritability of the higher centers, including the intellectual centers, the cortical centers, the nuclei, which control voluntary movements, including the corpus of Luys, the red nucleus, the substantia nigra, and the lenticular nucleus.

It is pleasant to see all of the symptoms disappear under the sterilized milk treatment. He believes that this form of treatment is the best method of treating chorea in children. Method of injecting the sterilized milk: In injecting the milk, use a fair sized needle, as a small one will get blocked; inject five c.c. of sterilized milk every three days. Some patients will only require four to five injections, while others, mild cases, may require 18 to 20 injections to effect a cure.

How is it that sterilized milk injections effect a cure in chorea? Within one hour's time after the injection, the W. B. C. increase to an astonishing number. From the normal 8,000 we get an increase of from 11,000 to over 24,000, 16,000 being a common number. They prevent toxemia and then a cure takes place. They likely do away with the micro-organisms which produce these toxins.

The control centers, the intellectual centers and the mid-brain centers regain their tone and the patient's nervous system runs in a normal groove again.

R. N. Andrews, M.D.

SUSPECTED JUVENILE TUBERCULOSIS: Frederick Eberson, Ph.D., M.D., Jessie P. Delprat, M.D., and Ernst Wolff, M.D., San Francisco (Amer. Jour. of Diseases of Children, October, 1930, Vol. 40, No. 4). The symptoms that occurred the great number of times in both groups (group 1, giving positive tuberculosis, and group 2, negative) were cough, nervousness, fatigue, and lack of appetite. It was found that in group 1, 11.2 per cent, and in group 2, 12 per cent presented no clinical observations in regard to tuberculosis. This study has brought out the important fact that there was little or no difference between a group with positive and a group with negative tuberculin reactions, as judged by nine symptoms and ten clinical signs under consideration.

Two groups of children were selected on the basis of their reaction to tuberculin. It was found that in the positive group (206 patients), 36.4 per cent presented no symptoms, as compared with 42 per cent among the negative reactors (100 patients).

The differences between the percentages of total occurrences of symptoms in both groups were never greater than 7 per cent, except in the case of cough, which in the series of persons with negative reactions exceeded those with positive reactions by 13.4 per cent.

In the positive group, malnutrition, dullness of the manubrium sterni, and enlargement of the cervical lymph nodes, occurred more often; while D'Espine's sign, paravertebral dullness, and auscultation exceeded among those with negative reactions. It was found that in the positive group 5.8 per cent, and in the negative group 15 per cent presented no roentgen evidence. In the positive group, hilus calcifications, increased bronchial markings, and thickened interlobar pleura, occurred more frequently; in the negative group, peribronchial infiltration occurred more often. Observations that have been considered in the past as pathognomonic of tuberculosis were associated with nontuberculous processes in the lung. Such roentgen evidence, occurring alone, appeared to have no diagnostic value.

Evidence that has been presented in this study showed that commonly accepted clinical symptoms and signs have no diagnostic significance unless these are definitely correlated with positive tuberculin tests and roentgen observations that are positive for tuberculosis.

In terms of these more modern concepts an explanation has been found for the infrequent pathologic evidence of tuberculosis at autopsy as compared with the diagnoses on the basis of *x*-ray films of the chest.

R. N. Andrews, M.D.

THE USE OF POWDERED MILK AND MILK DERIVATIVES IN THE CONCENTRATION OF INFANT FOODS: Arthur F. Abt, M.D., Chicago, Ill., and Benjamin F. Feingold, M.D., Glencoe, Ill. (Arch. of Ped., October, 1930, Vol. XLVII, No. 10). Nearly all underweight and also many normal weight infants have a much greater nutritional requirement than the 40-50 calories per pound of weight which is considered the average normal need. In the premature, the feeble new-born, the poor nurser, or in all infants whose capacity is so limited that the average 24-hour food requirement can not be met by the usual formulæ, it becomes imperative to concentrate the feeding. It is a too prevalent theory that dystrophic infants must be fed on dilute mixtures.

One of the first methods for concentrating infant formulæ was the addition of cream. Later cereal foodstuffs were combined with the mixtures. Malt soups and butter-flour mixtures were employed. More recently stronger milk mixtures (⅔ or ¾ milk) have been used. Concentrated protein milk and finally whole milk with very high percentages of carbohydrate, such as Schick's Dubo with 17 per cent sugar, have been advised. Unless the infant receiving a high carbohydrate formula was kept under closest observation, diarrhea easily developed. The author has found that the simple addition of powdered milk and milk derivatives can solve the problem of concentrating formulæ in a very practical and satisfactory manner.

The author has used calcium caseinate for breast-fed infants developing diarrhea. In these cases the calcium caseinate is added to water in the proportion of one level tablespoonful of the powder to three ounces of water. Occasionally we encounter a new-born infant with small, frothy stools accompanied by a progressive gain in weight. By preceding the breast feeding with one ounce of powdered protein milk mixture and limiting the time at breast to 10 minutes, we have been able to check the frequency of stools and readily clear up the sore buttocks. With prematures having normal stools, the addition to one to two drams of condensed milk to the whole day's feeding of breast milk will sufficiently increase the caloric intake to produce a progressive rise in the weight curve. Very often a normal child is encountered, who is not contented with the caloric intake offered by a formulæ prescribing such a volume, while on the other hand the baby is unable to care for a larger amount. In such instances, add condensed milk or powdered whole milk. The powdered milks and their derivatives also find a very useful rôle in the treatment of vomiting in infancy and childhood.

R. N. Andrews, M.D.

ROENTGENOLOGY

THE IRRITABLE COLON: John Muir, M.B. (Brit. Jour. of Rad., III, 33, Sept., 1930, p. 391). Many vague dyspeptic symptoms are associated with colonic disorders in which treatment of the direct gastric symptoms has proved only palliative. The author calls this relationship the "radiological symptoms complex," and it is present in cases in which the duodenum shows signs of irritation which may be due to local ulcer but no direct evidence of such ulcer is detected and the appearance may be due to reflex irritation as from a pathological gallbladder, appendix or colon. This relationship to pathological gallbladder and appendix has been noted frequently.

The irritable colon is the third relationship and these cases are marked by spasm of the pyloric vestibule, pyloris, and duodenal bulb of varying severity and location. There is tenderness on palpation over the colon often accentuated over the middle of the transverse colon where the site of its origin may be mistaken as being in the lower pole of the stomach, or at other times at its maximum over the descending colon. The irritable colon shows exaggerated and irregular segmentation or haustration eighteen to twenty-four hours after the opaque meal. At times there is also a definite narrowing without segmentation especially in the splenic flexure and descending colon which is generally better shown by the opaque enema. Here the radioscopic observation is very essential. The most information is obtained by a combination of the opaque meal and enema. The condition can generally be differentiated without difficulty from an organic infiltration by the permanency of the defect in the latter.

Some cases present localizing symptoms such as indefinite backache, cramp-like abdominal pains which direct attention to the colon, chronic constipation or occasional or persistent diarrhea. Apart from these, the most common case is one which presents symptoms usually associated with or ascribed to duodenal ulcer.

In conculsion, the author says that this study is an endeavor to interpret function by radiological means.

Jacob Sagel, M.D.

THE PATHOLOGY OF EARLY PULMONARY TUBERCULOSIS AS REVEALED BY X-RAYS: Peter Kerley (Brit. Jour. of Rad., III, No. 33, Sept., 1930, p. 404). The author discusses the earliest tuberculous focus in regard to its anatomy, situation and mode of entry of the bacillus. According to *x*-ray appearance, there are three distinct types of infantile pulmonary tuberculosis: (1) tuberculous bronchopneumonia, (2) localized caseous pneumonia, (3) diffuse caseous pneumonia. All three types present a visible pulmonary lesion, and in about fifty per cent enlarged bronchial glands can also be demonstrated. *X*-ray evidence supports the view of Ghon, McCallum and Küss that the primary infantile lesion is pulmonary and not glandular. The development of the three types is traced and the *x*-ray appearance noted.

In adults, the infraclavicular region is the commonest location, the right side being more frequent than the left. In 1922, Assman described a round sharply defined opacity in the right subclavicular region which he called a primary tuberculous focus, and which he believed was a common method of occurrence of tuberculosis. Two such case at autopsy showed a localized caseous pneumonia deep in the middle of the upper lobe where no physical signs would be possible. The lesion is identical in infants and adults, and differs only in location. For mechanical reasons, the base of the lung is attacked in children and the upper lobe in adults.

The prognosis in early cases depends largely on the inherent resistance of the patient, and also on the site of the lesion. With reasonable care most infants cure themselves. The early adult focus may heal by resorption or by calcification and fibrosis. The constant situation of the lesion in the infraclavicular region points more to reinfection rather than a recrudescence of an old infection. Large caseous pneumonias in adults are very dangerous, and tend to end fatally in a short time. This lesion is the "galloping consumption" of the last century.

A triangular caseous pneumonia in an adult appears to spread and break down more quickly than the round caseous pneumonia of Assman. Pure apical tuberculosis tends to heal spontaneously, and the prognosis is always good. This has been proved by Fishberg in a large series of cases.

Jacob Sagel, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Mental Aspects of Stammering. C. S. Bluemel, M.A., M.D., L.R.C.P. (Lond.), M.R.D.S. (Eng.). Clinical Instructor in Neurology of Colorado School of Medicine, etc. Illus. 152 pages. Price, $2.50. Baltimore, Md.: The Williams & Wilkins Company.

EDWARD JENNER AND THE DISCOVERY OF SMALLPOX VACCINATION.

Louis H. Roddis, M.D. 155 pages. Price $1.00. Banta Publishing Company, 1930.

This interesting little volume will afford an enjoyable evening's reading to any one. It includes references to the prevalence of smallpox in the earliest historical records, and describes the development of inoculation with smallpox. This practice, designed to infect susceptible individuals with mild smallpox, was practiced in the Orient during the seventeenth and eighteenth centuries. This measure operated with considerable success, although occasionally fatal cases developed in inoculated persons; yet it was infinitely preferable to the malignant smallpox, epidemics of which ravaged Europe frequently. Inoculation with human smallpox was popularized in Europe early in the eighteenth century by Lady Mary Montague, who observed the practice in Constantinople. She writes in the skeptical vein adopted by quacks of the present era: "I am patriot enough to take pains to bring this useful invention into fashion in England; and I shall not fail to write to some of our doctors very particularly about it, if I knew any one of them had virtue enough to destroy such a considerable branch of their revenue for the good of mankind."

In America, inoculation was warmly urged by Benjamin Franklin, and through his influence it attained considerable vogue.

Jenner's life is pictured in a readable manner. His medical career began at the age of thirteen, as a surgeon's apprentice. In his twentieth year he became a house pupil of the renowned surgeon and anatomist, John Hunter, and two years later took up rural practice in Gloucestershire. Jenner's broad interests in biology and natural history caused him to investigate thoroughly the common belief among the laity that infection with cowpox, such as frequently occurred among dairy-hands, invariably made them immune to smallpox. His memorable application of this fact in scientific manner, and his demonstration of the result by deliberately exposing those vaccinated to smallpox later, without infection developing, won immediate recognition in England, and imperishable fame to Jenner. In but a few years vaccination was practiced generally over the civilized world. In 1799 it was introduced in America by Dr. Benjamin Waterhouse of Boston, who obtained virus from Jenner, and vaccinated his own seven children. Later he tested its efficacy by exposing three of them to smallpox, with no ill effects.

Jenner's versatility and wide interests manifested themselves by his researches in biology and ornithology; he was a poet of no mean caliber, and a keen student of human nature. The latter quality reveals itself in the following passage, taken from a letter wherein he comments on the fact that the boyish appearance of his capable assistant interfered with his gaining the confidence of his patients: "For it is by appearance, not from real knowledge of things, that the world (at least a major part of it) forms a judgment. A look of significance, a peculiar habit, and a very scanty acquaintance with the human machine, will make a man pass current for a great physician."

Thomas Myers, M.D.

ALIMENTARY ANAPHYLAXIS (gastro-intestinal food allergy).

Guy Laroche, Charles Richet and François Saint-Girons. 139 pages. Trans. by Mildred P. Rowe and Albert H. Rowe. Berkeley, Calif., Univ. of Calif. pr., 1930.

This is a small monograph which was written first in 1920 in support of an argument at that time little held, *i.e.*, the occurrence of sensibility and anaphylaxis from alimentary absorption of foreign proteins. It has been translated into English and reprinted with footnotes by the authors written this year from the knowledge gained in the last ten years. While the information contained is now more or less commonplace, this volume is worth reading partly as a summary of the knowledge of alimentary anaphylaxis, and partly to see the progress of ten years. There is much left out, of course, but an evening spent on "Alimentary Anaphylaxis" will be well spent.

H. B. Sweetser, Jr., M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of **Commerce.**

PHYSICIAN'S OFFICE FOR RENT—Best location Midway district, corner Thomas and Hamline, Saint Paul. Rent $25.00 a month. Inquire at dentist's office.

WANTED—Resident physician. Salary and maintenance. Good opportunity for surgical experience. For particulars see A. G. Stasel, Superintendent Eitel Hospital, Minneapolis.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XIV February, 1931 No. 2

THE PLACE OF THE LOCAL MEDICAL SOCIETY*

William J. Burns, LL.B.,
Executive Secretary of the Wayne County Medical Society
Detroit, Michigan

YOUR Program Committee has been very kind in inviting me to Minnesota to give you a few slants upon the work and problems of the county medical society and upon some exceptional activities and pioneering steps which are bound to exert a growing influence upon every individual medical society in the country.

Every county should have its medical society and to insure success in all its undertakings, there should be but one and only one unit. In the larger cities special groups may be organized, such as a Medical Section, or a Surgical Section, but for the sake of complete harmony and permanent good to the local profession and to the public, each and every medical group should be an integral part of the parent medical society.

Among the modern functions which are being sponsored by progressive county medical societies in the United States may be listed: (1) *Definite organization* along economic and administrative lines such as has proven successful in the business world; (2) *A program of education and service* to the profession and to the public, which includes daily or weekly newspaper columns, speakers' bureaus, physicians' telephone exchanges and collection and credit bureaus, etc.; and (3) a very satisfactory *courtesy program*, which includes coöperation with the judiciary, and close contacts with business leaders, civic officials, legislators and other office-holders.

DEFINITE ORGANIZATION

Realizing that the county medical society must be the center of medical activity in the community, officers of many such units in the United States are reorganizing their societies along business lines and placing the administration of the association's affairs in the hands of a full time employee. The Society's importance to the community is too great to hazard it by a careless or indifferent attitude. Outside interests have already attempted to lessen the influence of the county medical society. Now is the time to step in and by positive activity save the situation before it is too late. Better business administration would mean better programs, larger attendance, greater influence and enhanced prestige to the whole profession, with resulting benefits to the individual practitioner. Members of smaller county societies know the advantages of joint meetings with neighboring societies, for example, the enthusiasm and benefits of a tri-county meeting. The day must come when not only will every larger society have a definite program along economic lines, but the smaller counties will unite in groups of three, four, five or six societies, outline a coöperative plan of progress and employ a full-time individual to execute the business details. Good results must follow. This plan is to the interests of the individual practitioner of medicine.

A BULLETIN

Wherever possible, county medical societies should publish a bulletin. It is one way to keep up the interest of the membership, and to tell the world what the local medical profession is doing for the community good. In addition, a bulletin in the hands of a live business manager can be a source of revenue, as many manufacturers are glad of an opportunity to use the medical man's publication to advertise their products. The mailing list of a medical "house organ" can include the names of physicians in neighboring cities and also prominent laymen, and can be the means of increasing the prestige of the medical men who publish it.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 14, 1930.

PROGRAM OF EDUCATION

The movement of popular medicine had its origin some years ago, and, through the stimulation of the American Medical Association, has developed from small beginnings until it has become a very influential organization in some county medical societies of the United States.

EDUCATION COMMITTEE WORK

In Toledo, Ohio, it was my privilege to see an educational program launched and developed. For years back, several of the more foresighted members of this county medical society realized the value of a program of popular medical education. It remained simply to put it into being. Numerous meetings were held over the luncheon table to discuss ways and means. At one notable meeting back in 1924, the officers of the society decided finally that problems dealing with clinic abuse, contract practice, unethical conduct, fraudulent advertising, quackery, misinformation of the public on matters of health, and a host of other things could be best met by broadcasting first hand the doctors' viewpoint on these medical matters, rather than the laymen's. This was a departure from the old notion of keeping silence on such matters from a mistaken idea of "ethics." This position is hardly tenable. The distinction has well been made between "advertising," which is closed to the physician as an individual, and "publicity," which is open to the profession as a whole. Not all the members, however, were sold on the soundness of the idea. You gentlemen probably will encounter the same condition in your own ranks; yet it is clear that your responsibility as guardians of the public health demands that you take more than a passive interest in such matters. In addition, your acceptance of this obligation will result in increasing your financial as well as your scientific revenue.

The officers of the Toledo Academy decided definitely on the necessity of forming an Education Committee to look after these matters in point. Such a committee would bring about a better relation between the public and the profession, which would be of advantage to both.

DAILY NEWSPAPER COLUMN

The beginning of popular medical education in Toledo was made early in 1926 with weekly health articles in two of the leading papers. The committee's plans were visionary. It had no precedent to follow. Few realized its possibilities. The first year was spent mainly in building up experiences and gaining contacts. It can truthfully be said that it sold the idea of honest guidance and authentic information in medical matters to the newspapers and the public. This was a worth-while accomplishment. But the committee quickly realized that the infrequency of appearance of its articles would lose force. Plans were set afoot to publish a daily medical article. This was a radical innovation in newspaper circles. True it is that daily newspaper medical articles had appeared previously in syndicated form. These, however, reflected only individual opinion in medicine. The "Said by Toledo Doctors" column, with its daily article, attempted to reflect the accepted opinion of the bulk of the medical profession. In this respect, it pioneered.

On February 27, 1927, the new column was inaugurated. During the next two years, a daily article was printed, followed by a "Question Box." Society members submitted articles to the Publications Bureau, which revised and edited them to fit into the program. Names of physicians were not signed to the articles. Self-diagnosis and self-medication were discouraged. The motto throughout was: "See your doctor first."

SPEAKERS' BUREAU

Realizing that the Speakers' Bureau was a necessary adjunct to the work of the Publications Bureau, this department was formed in 1927. For the first half year it worked sporadically. But the profession realized that the Speakers' Bureau was a powerful and valuable arm in bringing the medical man in direct contact with the public, so a concerted effort was made to boom this feature. The result was that during 1928 and 1929 the Speakers' Bureau sent out an average of ten lecturers each month to address lay organizations, civic clubs, etc. The public seemed to be hungry for information dealing with its health. These two departments, the Publications Bureau and the Speakers' Bureau, had a far-reaching effect. In Toledo, they did more than all the preaching in the world to counteract the propaganda of the quack and the pseudo-medical man. They established the doctor in the hearts of the people. More important, they made patients proud of their own doctor, and resulted in building up that confidence which is so necessary in the successful care of a patient.

With a full time secretary, any county medical society or group of societies could establish a Speakers' Bureau, and institute a weekly or more frequent newspaper column, with far-reaching and beneficial effects to the organization and its members.

PROGRAM OF SERVICE

A modern county medical society cannot do full justice to its members and to the public by a program of education alone. It must augment it with a program of service. A collection and credit bureau and a physicians' telephone exchange are two good items in a program of service. In competent hands, both can be profit-making activities. Here is a brief consideration of each plan.

CREDITS AND COLLECTIONS

For years, the Wayne County Medical Society of Detroit has successfully maintained a physicians' business bureau. For obvious reasons, this bureau uses a different name than that of the society and has its own corporate entity; however, it is controlled by a committee of physicians from the Society.

It offers three distinct services to every individual member of the Society: first, credit ratings on every person who visits the doctor's office can be obtained, in case a physician doubts the paying ability or paying inclination of his patient; second, the Delinquent Account Letter Service can be used whereby a series of letters is mailed by the Bureau to slow-pay patients to aid the doctor's collections; third, the collection division offers its dependable help to the physician who wishes to have his older accounts adjusted or financed.

Annually, the Bureau sponsors a lecture course on "Economics." These talks, given by prominent laymen who are specialists in their fields, are presented at the regular weekly meetings of the Society during one particular month. Physicians, their office secretaries, bookkeepers, workers in hospital offices, and all others interested in the business side of a doctor's practice are invited. This year the subjects of the lectures were: "Systematizing the Office Records" given by D. J. Terpeney, Dean of the School of Commerce, Detroit; "Credit Information," by Lee S. Carrick, Service Director of an industrial bank of Detroit; "Suggested Aids in the Collection of Accounts by Physicians," by Grahame Coffee, Collection Manager of Detroit's largest department store; and "Two Prescriptions: (1) Better Coöperation Betwixt You and Us; (2) Investment Buying by Doctors," by Kenneth Barnard, Manager of the Better Business Bureau of Detroit.

Along similar lines, another activity of a county medical society can be the publication of a "Confidential List for Members Only." This confidential list, added to monthly, contains the names of people with whom the society members have experienced unsatisfactory financial relations. (This is sometimes referred to as the "Deadbeat" list and of course is in code, to eliminate the possibility of law suits.) A copy of this list is mailed to each member so that he may study it whenever a new and questionable patient appears in his office for service. A master-list should be kept in the office of the medical society.

PHYSICIANS' TELEPHONE EXCHANGE

A county medical society activity which is spreading across the country is the physicians' telephone exchange. In a certain midwest city, such a bureau has been running twenty-four hours per day since August 1, 1925. It was started with a campaign for members. Approximately 100 subscribers joined before operations were begun. This number increased gradually to 160 (close to 50 per cent of the active membership) and this is believed to be the saturation point. The subscribers are assessed $3.50 per month, payable quarterly, for this extra service. It is owned and controlled by the society, with the board of trustees acting as a supervising committee, but it is operated as a separate entity. The bureau is not incorporated but is classed as a department of the society, which is incorporated not for profit. The Doctors' Service Bureau has its own employees and its own system of bookkeeping; the bureau has nothing to do with the general funds of the county medical society. The main object of a physicians' service bureau is to be a connecting link between the doctor and his patients. Most of this bureau's work consists in patients calling for their family physician or making appointments with a specialist, which is desirable business. It gets a share of emergency calls but these are necessary evils. Often there is no remuneration to the doctor for such work. But such a bureau, being a quasi-public agency, must accept the good with the bad.

TELEPHONE EXTENSIONS

Fifty-five subscribers have installed direct telephone extensions from their offices or residences (or both) to the Doctors' Service Bureau offices. A special switchboard has been installed which combines main trunk lines and these extensions. Every time the telephone rings in the doctor's office or residence, a light signal is received in the bureau's office. If the doctor fails to answer, the message is taken until he returns. In this way, no business is lost by a subscriber with an extension. It is a boon to the younger man who cannot afford the expense of even an eight-hour office assistant, not to speak of twenty-four hour telephone coverage. The subscriber pays the telephone company a sum for this extension equal to the aerial distance from his office or residence to the bureau office.

The operation of a physicians' service bureau brings with it loads of grief. Just try to please everybody! But it is worth all the trouble. A bureau helps to pep up the society and makes it the center of medical activity in the city. It helps to unify the doctors, which seems to be a problem in every city, town and hamlet. The advantages seem to outweigh, by far, the troubles. The people come to the society headquarters for all medical and miscellaneous information, including opinions on quacks, and it is felt the bureau has been largely the cause of this decided advantage.

MEDICAL DEFENSE

Another valuable item in a program of service is medical defense against malpractice suits. In Michigan, two dollars of the dues sent to the State Society go to a Medical Defense Fund. It is interesting to note that in the city of Detroit, not one malpractice suit has been lost by a physician during the past three years. It pays to be organized.

The Wayne County Medical Society has luxurious club rooms, a cafe and a roof garden for the use of its members. Originally, it purchased a residence for $17,500 which, in the boom of 1926 was sold for $110,000. Bonds were purchased and plans for the erection or purchase of another "home" are now before the Board of Trustees. The present leased headquarters occupy the eleventh floor of a skyscraper facing the Art Center. The men especially enjoy the dining room feature of the society and gather every noon for good food, conversation and cards. All committee meetings are held at the headquarters over the luncheon table. The Cafe certainly helps good fellowship and *esprit de corps.*

A program of service in conjunction with social features is necessary for a county medical society if it hopes to achieve that place in the sun which brings tangible benefits to its individual members.

COURTESY PROGRAM

Physicians frequently learn of the illness of a medical confrère. They think of it momentarily and then forget it in the stress of making a call or getting to the office on time. Such a matter deserves more attention: for example, the mailing of a sick card, a daily telephone call for reports, a visit from a member of the welfare committee, and the insertion of the sick man's name in the Bulletin would not be amiss. When one person is responsible for the fulfillment of a courtesy program, it is carried out with infinite pains.

Last March 15th, a certain Ohio doctor (like thousands of other poor mortals) was making out his income tax report. He called his medical society office. Could he, he asked, take as a deduction the legal expense incurred in fighting a malpractice suit which had been inflicted upon him during the past year. He was made very happy in the knowledge that this was an allowable deduction and he took down the exact citation in order that there would be no question concerning his report when it reached the income tax office. This was another small item of service rendered by one charged with certain responsibilities of courtesy, resulting in greater good-will for the county medical society.

To protect its own and its members' interests, and to grow in influence and prestige, a county medical society must become active in civic affairs, and contact business leaders, legislators, judges and other officeholders.

CONTROL OF CLINICS

Recently, in a suburb of Detroit, an uplift association decided to promote a round-up of the pre-school child. This lay organization made all its plans without interviewing the representatives of the medical society. It decided that a school building would be the proper place for such a "demonstration." All basic plans for the examination of 1,000 children—a strictly medical gesture—were formed without a bit of advice from medical men. The laity, as usual, was making plans to run the doctor's business. Fancy a lay organization attempting to formulate plans to run any other business.

Physicians first learned of the program when they received a letter advising them of the hours and days they were expected to be present at the school house to perform the examinations. The invitation read: "The Clinic, as a part of the round-up for almost 1,000 children, will be held June 24th, 25th, July 1st, 8th and 10th from 9:00 A. M. to 12:00 Noon." Such a plan was so contrary to the ruling of the Wayne County Medical Society, which stated that all such examinations were to be made "in the offices of private physicians," that doctors in this suburb, members of the society, suggested to the officers of the association that a change in plans might be advisable. These physicians wished to coöperate in the campaign in the interests of better health. They found, however, that the round-up promoters were adamant. They would go through with their plans, they said, if it were necessary to import doctors from outside the city and the county. In fact, the first day's examination was held as scheduled and a few physicians, not members of the society, were present. The threat that imported doctors would be used bore no weight, as the Michigan State Medical Society heard of the plan and upheld the ruling of the county society. Doctors in other counties had no desire to step into a political trap. The better qualified physicians of the city were not present at the examinations, which to anxious parents were far from being a success.

That which should have occurred in the first place, before the inauguration of any plans, was the final result: a conference between officials of the lay association and the proper committee of the Wayne County Medical Society. This friendly get-together resulted in mutual understanding and the formulation of plans agreeable to the Wayne County Medical Society and in the best interests of real public health. In future, all medical plans in this suburb will be referred to the physicians at their instigation and not when completed. The children—future citizens of this suburb—will receive better attention from the physicians in their own offices. Thorough examinations will be given and all defects will be discovered. Better general health in the years to come will be the direct result.

Medical organization has again lived up to its unsefish principles of better public health as well as the protection and education of its members.

CONCLUSION

You have heard a few of the activities of a modern county medical society which employs an executive secretary to carry them out. Without a man responsible for these duties, the bulk of this work must be borne by some member of your society. A physician has not the time to give from his practice to a thorough handling of it. Some things must be glossed over and slipped. Perhaps those things of most concern to you may be in this number. In any case, admitting the doctor's full capability, and usually he is very capable (or he would not have been chosen for office by his confrères), it is not just to saddle detail work of this kind on his shoulders. More than that, it will mean a failure to progress along the modern lines of education, service and courtesy which you all desire. It becomes absolutely necessary to entrust such matters to one who can give to them his whole time and undivided attention. Let the policy of the organization be dictated by the officers; the details of its execution can be handled by a full-time man. Such a manager is styled an Executive Secretary. I have been told that the county medical societies throughout the country which have decided upon a modern program and have employed an executive secretary to insure its accomplishment seem to be outstanding. They tell me the program has been important to all in its relation to the actual scientific practice of medicine. Therefore, I may venture the prediction that every society of prominence will sponsor such a program and have an executive secretary in the very near future. The investment will pay rich returns, economically and professionally.

THE ECONOMIC TREND IN MEDICINE*

J. G. Crownhart, Secretary, State Medical Society of Wisconsin
Madison, Wisconsin

IN medical organization possibly few but officers appreciate so fully that the first aim must ever be the advancement of the scientific attainments of every member. Those who would fulfill their obligations as officers must never lose sight of this foremost purpose. As it is successfully advanced, experience demonstrates that many seemingly independent and difficult problems disappear.

On the other hand, without tinge of commercialism, organized medicine has a primal duty to perform in safeguarding and promoting the material welfare of its members, which is in no sense different from the welfare of the public. This can be performed without making the attainments incompatible with a higher type of public service, for, indeed, the two can only proceed hand in hand.

In the time allotted, I stress here only this seemingly materialistic side of organized effort. Almost unwillingly I am compelled to submerge some of the more humanitarian aspects and attainments. In the nine months just past, visiting the county medical societies of Wisconsin, we have been able to point out concretely how four comparatively small accomplishments of their State Society have saved every member $27.00 a year in perpetuity,—$17.00 a year more than their state dues. Computed on the basis of the bankers' investment table, this makes the certificate of membership worth almost $300.00 on these four items alone.

To this we have been able to add the recital of achievements,—measure after measure, project after project,—which have potential values running into many thousands of dollars, which we are not able to compute or allocate with definiteness to any given member. These projects have met with success because primarily they have been of public service. The physician does not profit on the income that sustains him, but only upon that usually thin top layer that spells laying away a competence for old age, making possible the education of his children and affording the enjoyments of well earned comforts. Within this narrow bracket organized medicine in Minnesota and Wisconsin has done much, and can do more, to promote the worthy ambitions of every member.

Some two years ago, however, the Council of the Wisconsin Society had a conscientious feeling that, while we had been able to accomplish very gratifying results, such attainments largely had been possible through the correction of existing injustices to members of the profession, particularly through relieving those injustices formerly to be found in the laws of the state. With this field of effort for the most part now obviated, the Council believes that a broader opportunity for service to the members and public alike lies in the adoption of a broader viewpoint,—the recognition of the value of statesmanship to guide the future of medicine and public health endeavor.

Today, as never before, they feel there is unfolding and developing with great rapidity a newer recognition and clearer appreciation of the value of good health and the cost of preventable disease. Legislatures, industries, insurance companies and school boards all are cognizant of the tremendous possibilities for health conservation which would be reflected in lower taxes and increased profits. As for the individual, something has happened that possibly no one could have foreseen a few years ago. From the precept of frugality, today man is besieged on every side by high pressure salesmanship to enjoy present comforts and luxuries by mortgaging his future income. Urged even by some banks to save only presently so to spend, the individual has brought home to him most vividly the fact that the so-called unexpected illness climaxing a mortgaged income may spell financial disaster. For such disaster the costs of medical care—the straw that broke his financial back—is burdened with all the blame.

Today, as at no time in the past, large numbers of people are ready to receive, frequently to seek, medical charity where they would never think of accepting, much less soliciting, charity in the way of food, fuel, light, clothing or shelter —other basic necessities.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 14, 1930.

Added to these two factors, the Council is convinced that the ever present and age old desire of all mankind to leave a record of some useful and unselfish act for posterity to revere, is being translated more and more into terms of doing something for the public health. You can name to yourself twenty to thirty organizations in Minnesota that have such a purpose as their primary or secondary goal. The disturbing element is not the altogether fitting end in view, but the frequent pathetic attempts at proper translations through hasty or ill-advised legislation.

Josh Billings said some years ago, "It ain't ignorance that hurts people so much as it is knowing so many things that ain't so." The identical situation here exists. It is not that the layman and his organizations are insincerely interested in advancing individual and community health. Indeed they are most sincerely interested. But the real truth is that what will advance the public health is a highly technical subject. Physicians, like supervising architects, must draft the plans and closely supervise the construction if the building is to stand in storm and sun. Much must be accomplished through education which is almost as slow in results as the generations.

Now we find that new agencies have recently entered the field. Non-medical organizations and groups seek to hasten the end in view by group action and legislation. They undertake to become the architects and the engineers. The dangers to the public itself of such a diversification and diffusion of authority, however, are so apparent to you as trained technical advisors that you wonder why others fail to appreciate and recognize the hazards. This modern tendency for immediate action, this demand for speed, this impatience with time for winnowing and sifting, brings to the organized profession many of its present and most pressing problems.

Busy physicians cannot hope to find the time to meet as individuals these group problems. Simple questions may receive momentary solution but to chart the course which shall determine the policies, ambitions and lives of men in a great and forward looking profession requires consultation, consideration and research. Only through a unity of action, a devotion to high purpose, can organized men and minds find the broad way worthy of the past. In this effort there are no short cuts to a real and lasting success. But scientific organizations, by enlisting the support of all members, may well undertake to diagnose and treat the specialized needs of a whole people. Such an organization may well render a distinguished service to the public and members alike by the development of a statesmanship in medicine that will offer competent direction and forward looking policies further to enhance the value and extend the benefits of scientific medicine to a whole people.

Such efforts require funds which may only be secured immediately by increased dues. Every society, I care not what it may be, can only justify its dues upon at least dollar for dollar benefit and dividends to its members. Such returns, far exceeding the dues paid, long have been made manifest in Minnesota and Wisconsin. Money so spent in the purchase of profits is no luxury.

We will never have an appreciation of the probable costs of insufficient direction and action, so long as competent effort forestalls what would otherwise occur and the consequent assessments. So it is that the program of the future in direction and prevention may not bring such apparent returns. But just as you can justify the expenditure of money for prevention of typhoid, diphtheria and smallpox, so must each physician appreciate that the efforts of his state society and parent organization will also pay dividends far exceeding those of the past.

It has been my privilege to explain this situation to forty-four county medical societies in Wisconsin during the last few months. Neither advocating nor defending a proposed substantial increase in dues, it has been my sole purpose to outline in more detail the general propositions submitted to you this evening. Of forty-four voting, only one has voted against increasing the dues from $10 a year to those of Minnesota—$15 a year. Wisconsin, appreciating the foresight of your officers, is frankly following in your footsteps.

There will always be those who will say, "It can't be done." But if the program of Minnesota and Wisconsin meets fairly and squarely the needs of the great group of physicians, it cannot fail of accomplishments that will be valued by thoughtful members and welcomed by the public. Such accomplishments will far exceed those of the past even though they take years, instead of months, in the doing.

This is a world of progress. It is a day of changing problems; a time for new foresights. The dying and the dawning made by the advance must keep us ever alert to the ideals which the profession of medicine demands. More than ever the physician has become the apostle of humanitarianism. By organization disease is routed; by council and group action you achieve. In this exceptional idealism to advance the profession of medicine by a public spirited united action, Wisconsin joins the vanguard of Minnesota—ever conscious that where the vanguard camps today the rearguard bivouacs tomorrow.

THE CAUSE OF GINGER PARALYSIS DEFINITELY IDENTIFIED

The cause of ginger paralysis has been determined. This paralysis, which has afflicted thousands of victims, is not caused by ginger at all, but by a compound known to chemists as tri-ortho cresyl phosphate. This chemical is the main constituent of technical tricresyl phosphate, which is widely used in trade circles, especially in the manufacture of varnishes, shellacs, and similar preparations. Being cheap and readily obtained in any quantities, it appears to have been used by irresponsible makers of so-called ginger extract to replace the ginger. There seems to be no question that the adulterated paralytic ginger extract contained tri-ortho cresyl phosphate in an approximate concentration of about two per cent.

The United States Public Health Service has been working on the public health aspects of "Jake paralysis" since the wide appearance of this condition in certain sections of the country last winter and spring. In attacking the problem, it soon became evident to investigators that they were dealing with a new form of paralysis and one in which many possibilities were involved. As the investigations proceeded, it became evident that some form of phenol was the causative agent. Soon attention was centered on technical tricresyl phosphate. Chemists of the Prohibition Bureau had found similar substances in suspected extracts. As a number of different chemicals enter into the manufacture of this commercial product, it became necessary to separate them and find out what effect each might have if used in a beverage. This has been done and it has been found that tri-ortho cresyl phosphate, either itself or in combination with other chemicals of harmless nature, when given to various kinds of animals will produce exactly the same kind of paralysis as that caused by drinking of "Jake." The Public Health Service has no record of a single case of paralysis caused by ginger preparations manufactured by reputable pharmaceutical concerns. Tri-ortho crsyl phosphate is, therefore, definitely established as the specific cause of the cases of so-called "ginger paralysis."

Studies conducted on laboratory animals show conclusively that a paralysis of the extremities can be produced uniformly in monkeys and other animals by the injection under the skin or by oral administration of the chemically pure as well as the technical tri-ortho cresyl phosphate. The failure to produce any symptoms, whatever, in monkeys with enormous doses of this poison given by mouth indicates that it is practically not absorbed from the intestinal canal in that species.

The precise reason for including this remarkable substance as one of the ingredients of a substandard fluid extract of ginger made and sold for beverage purposes will probably never be known, unless a confession is wrung from the guilty ones. It seems entirely reasonable, however, to suppose that it was included on account of its physical or other properties which make it difficult to distinguish from the normal ginger constituents. Only a chemist of considerable ability could have thought of this; and had there been anything known about the pharmacologic action of this substance and the possible dire consequences, it is probable that it would never have happened. From this the question naturally arises as to whether there are not many other organic compounds of great medicinal interest, perhaps some with great possibilities for the treatment of disease, awaiting the attention of investigators.—*Health News,* U. S. Public Health Service, December 31, 1930.

THE ECONOMIC TREND IN MEDICINE: WHAT IS IT?*

Olin West, M.D., Secretary of the American Medical Association
Chicago, Illinois

MR. Chairman, Ladies and Gentlemen:

I was somewhat dismayed as I sat over there in the corner and observed the sartorial splendor of most of the speakers who have preceded me on this program. Much as I loved George Crownhart and John Peck, I love them ten times more now that they have dared to come up here and speak to you with old suits of clothes on. For fear that you don't know, I want to tell you that both of them have not only tuxedos but have dress suits and can wear them just about as gracefully as any man can wear monkey clothes.

I am greatly pleased, Mr. Chairman, to have the privilege of participating in this meeting of the Minnesota State Medical Association, and particularly so since the American Medical Association has recently honored itself by election to its presidency of that very lovable and modest gentlemen and splendid surgeon, Dr. E. Starr Judd, one of your own members.

I note at the head of the printed program tonight what appears to be the topic of this general discussion, "The Economic Trend of Medicine," and I notice at the bottom in little letters that get smaller as one goes further down, the topic, "What Is It?" It appears that I am expected to tell you what it is. I wish I could.

Definite trends are not quickly established, but result from well considered opinion based on a reasonably broad experience extending over a considerable period. Insofar as I am able to evaluate the situation, there are not very many new trends in medicine itself. Currents are quickly developed and frequently the tendency is to drift with one or another current. Sometimes we are caught in eddies and linger there until a stronger current or a new current bears us on, or across, or even carries us back.

We are disposed, somewhat, I think, to confuse noise with trend. We are rather prone to believe that the vociferous efforts of propagandists constitute trends. Sometimes this noise and the propaganda may come from within the medical profession itself, but generally speaking most of it in latter days has come from outside.

There are agitators who love the glare of the limelight that of late years have made many proposals and have made so much fuss about them that some of us have been disposed to believe that they represented trends in medicine. There are self-seekers who would gain support for their own selfish schemes that have led some of us to think at times that these schemes represent definite trends in medicine. There are the reformers who are always dissatisfied with what is, who seek to overthrow all that is practical and to establish a sort of heaven on earth, who have fooled us at times into thinking that they represented definite trends in medicine. And I have listened to them and have wondered what sort of a situation would be created if they could realize their dreams. I cannot conceive of any hell that would be more hellish than the situation in which some of these reformers would place us, in which everybody would be like everybody else; everybody of the same mentality as everybody else; everybody with exactly the same opportunities as everybody else and with the same capacity for taking advantage of opportunities.

There are meddlers outside of the medical profession who, in my opinion, are generally actuated by the sensations that come from sore toes, that have set up one or another scheme and have fooled the public and sometimes part of the medical profession into believing that they represent definite trends in medicine.

There are misguided philanthropists who I have no doubt are actuated by the worthiest motives, that have proposed this, that, and the other scheme, and have put so much propaganda behind their schemes as to lead many to think that they constitute definite trends in medicine.

And there are the politicians of a certain kind who never lose an opportunity to take advantage of any chance that offers for multiplying votes in their favor, that have proposed and even succeeded in getting enacted into law all sorts of visionary plans supposedly for the improvement of this, that, or the other condition, and some of us have been disposed to look upon these as constituting the definite trends in medicine.

---

*Address before the Medical Economics meeting of the Minnesota State Medical Association, Duluth, Minn., July 14, 1930.

As examples of some of these activities I might mention, in passing, the enactment of legislation supposedly intended to serve the best interests of the veterans of the World War, through which will be entailed expenditures of many millions of dollars but will not result, in my humble opinion, in providing the best care for those veterans of the World War justly entitled to the best care that can be provided. These schemes contemplate extending medical and hospital service to many who served in one capacity or another who are in no sense entitled to free medical or hospital care at the expense of the government or at the expense of the general population. Under the provisions of this legislation free care is to be offered and given in cases of disease or injury that has no connection with military service. The tendency of any such scheme is to destroy the independence and the manhood and the self respect of those who accept the dole that is so offered.

There is a tendency that is very decided, promoted by those outside of the medical profession, for the most part, but aided to some extent by some of the members of the profession itself, to dissociate public health from medicine. Public health, I believe, is distinctly a field of medicine. Public health administration should be through trained medical men and should not be resigned under any circumstances, not even under the appeal of subsidies from government, to laymen without medical training and knowledge. This is a trend that did not originate in the organized medical profession, but it is one like some of the other tendencies I have mentioned, that ought to receive the most thorough and careful consideration by organized medicine and ought to be positively, militantly opposed.

There seems to have developed a very definite trend in medicine itself toward over-organization. I don't mean over-organization of county medical societies or of the state medical association, but I mean the establishment of almost innumerable independent societies and organizations of various kinds composed of the very members of the fundamental medical organization in the United States.

I am convinced that this is not for the best interests of scientific medicine and consequently is opposed to the public interest. As Mr. Crownhart said so well, there is no difference between the material interests of physicians and the material interests of the general public. I have never known anything to be done to promote the interests of the medical profession that did not at the same time, and generally to a much larger degree, promote the interests of the general public.

There is a current that I think it is well enough to mention which has been stirred by a minority element of the medical profession that tends to the commercialization of the practice of medicine. It is not a definite trend, in my opinion, because by far the greater number of physicians in the United States are actuated by the same high purposes that have always characterized the honorable profession to which they belong, and under the ideals and the traditions of the profession the making of money has never been a prime purpose. This tendency, originating upon the part of a minor element in the profession, in my judgment, is one that should be openly and persistently combated by organized medicine everywhere. When we commercialize the practice of medicine we shall destroy scientific medicine. The truly representative physicians of this country, greatly in the majority, should not permit a small minority to misrepresent their professional attitude and to prostitute a great scientific and humanitarian profession.

There is another current which stirs along the banks which should be broken *now*—also originating with a minor element in the profession, and having a tendency to break down medical ethics. This should be openly, actively, and persistently opposed by the forces of organized medicine. Remove ideals, remove tradition, remove ethics, and destroy medicine. The existence and observance of the principles of medical ethics, as written and adopted, constitutes the best safeguard of the public interest and the best safeguard of the profession itself.

But with all of these things and with others which might be mentioned, the one really big trend in medicine today is bigger and more pronounced and just as true as it has always been. It is the trend for the promotion of the art and science of medicine and for the extension of its benefits to mankind everywhere. There has never been a time when the avenues of expression of opinion in scientific medicine have been as fine and as efficient as they are today. Our medical journalism, in my humble opinion, is far superior to any journalism that has ever characterized medicine in the United States. Our medical societies, parts of the fundamental organization in this country, are becoming more and more efficient in dealing with the problems with which it is at once their right and their duty to deal. Our state societies, for the most part, have advanced in remarkable fashion within the last few years and, as has been shown here tonight in the statements of the secretary of one state society and the president of another, are taking their place in the leadership of the life of their states in a very remarkable way. As I said today on the floor of the House of Delegates, I remember distinctly having had the privilege of attending a meeting of the Minnesota State Medical Association some six or eight years ago. The atmosphere today is as different as one could well imagine, fine as the spirit was back there. The Minnesota State Medical Association has made remarkable progress in assuming the leadership that naturally devolves upon it, and in my opinion has achieved a splendid program of accomplishment within the last six or eight years. As I interpret what I have heard here today, I believe the good work has just begun, and that it is going to be carried on in a much more efficient manner than has been done heretofore.

There are undoubtedly many movements that are aimed against medicine. A regular siege has been laid. Just why I don't know; in considering the matter in my official report to the House of Delegates I tried to explain it on the ground that it may be true that we have proceeded in our honest effort to inform the public, to educate the public, as we usually say, to the point where many believe that they know enough about it to make the rules of the game and dictate procedures. A little knowledge is a dangerous thing, and if my diagnosis of the situation is correct then certainly it proves better than anything else could prove that our outstanding duty at the present time, beyond our duty to do whatever we can to make every member of organized medicine a better physician and better able to serve those who need his services, is to carry on our program of education of the public and to work unceasingly at that job until the truth about medicine shall prevail.

I don't know what is going to come of many of these currents that some of us have interpreted to constitute trends, but I am thoroughly satisfied, Mr. Chairman, that if organized medicine will bend itself with renewed determination to its fundamental job of doing everything that it can do to promote the art and science of medicine and to improve the quality of medical service rendered by every one of its members, and will then do its duty toward giving the public the benefit of useful information that none others can give and that the public can digest and assimilate, the truth about medicine will prevail and any untoward trends will be stopped.

I am grateful, indeed, Mr. Chairman, for the kindly hearing that has been given me.

HEALTH EDUCATION*

F. H. MAGNEY, M.D.
Duluth, Minnesota

HEALTH is of vital importance to everyone, and most people are intensely interested in it. It is only natural that the sick should be, in order to be relieved from pain and discomfort and so to enjoy the fruits of good health, but even the healthy wish to continue in a state of well-being, that they may further enjoy its benefits, and that life may be prolonged. This latter group has been constantly increasing and they are beginning to manifest a real interest in health and its promotion. This interest now aroused should be further stimulated, and it thus falls upon the shoulders of the medical profession to see that wise and judicious counsel be given and that this new movement shall continue to grow.

Recently, when Edison was asked what he would choose if he could have any one thing in the natural, mental and spiritual world, he replied "good health." That this desire is not only held by people of the Edison type, but by many others as well, is manifested by the continued interest taken by the millions in the syndicated health columns of the daily papers. The anagrams, limericks and many other fads have gone by the board and at present the crossword puzzle is gasping its last, but the press, feeling the pulse of the public through letters and questions stimulated by health columns, has not only continued printing such material but has added space so that often more than one doctor is carried on the individual paper's staff.

Industry is interested in the health of its employees because good health promotes efficiency, increases production and tends to prevent accidents. Through safety education and safety devices, the accidents have been cut to a minimum, but loss of time and efficiency, due to illness, is now their big problem and they are looking to the medical profession for help. They are not only supporting every move we make along this line, but are offering suggestions and creating opportunities for us to step in after they have prepared the field.

Furthermore, luncheon clubs, parent-teachers associations, churches, Y. M. C. A.s and Y. W. C. A.s, through their different fields of activity, of which "Health Week" is one well known example, are constantly clamoring for health talks.

Recognizing this demand, the medical profession owes it to the public and to themselves as well, to supply this information in order that people may profit by what scientific medicine has to offer. No company or corporation, having goods of merit, has ever suffered by having the public well acquainted with its products, but on the contrary has profited thereby, and the same applies to medical services.

While there is a great deal of interest in health education, this can be still further increased by proper propaganda. The pediatricians have proven this fact through their feeding clinics, talks before mothers' clubs and written articles distributed through private and even governmental agencies. Twenty years ago pediatrics was practically unheard of as a specialty, while today even the most humble mother insists that the growth of her child be supervised by a baby specialist.

We point with pride to the increase in the span of life during the last few years, but we often forget that practically all of this advance has been during the first year of life. When we, as a profession, have educated people to use our services in supervising their health through all the periods of life as well as during childhood, it seems impossible even to venture an estimate of the further increase in the span of life.

The St. Louis County Medical Society established a committee on public relations three years ago and the acceptance of its activities, by the public, has been most gratifying. While its policy has been passive, in supplying a demand rather than trying to force a definite program on the public, neither it nor its individual members have missed an opportunity to make known that they are at all times willing and ready to supply medical information whether it be in the form of a talk or by a written article. A speakers' bureau was first established and a card index system was set up, carrying names, addresses, telephone numbers of speakers, types of meetings they preferred to talk to and the subjects they were interested in. A record of the talks given has been kept on each man's card for the sake of future reference. The committee has in no way discouraged any speaker talking on his own initiative apart from the agency of the speakers' bureau, but on the other hand has rather encouraged it as long as the talks were delivered unselfishly and in the interest of health and the profession. It has been interesting to note that there has never been any expression of suspicion that any member of the medical society was seeking too much publicity through public expressions since the establishment of this bureau, while before its organization such statements were frequently suggested.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 14, 1930.

A class in public speaking, limited to doctors, was organized and given by the University Extension Division. This covered a period of one semester and the nature of the instruction was especially planned to prepare those taking the course to give short talks. The didactic phase was made to cover as little of the time as possible and more time was devoted to the actual experience of giving talks before the class. Approximately twenty per cent of the profession in the city registered for the course.

Short résumés of scientific papers presented before the society have been prepared for the daily papers, stressing those parts which would be of special interest to the public. While this brought the names of the authors of these papers into print, we felt that any publicity they might get in this manner acted as a reward for their efforts in preparing and presenting these papers and the same privilege has been open to any member willing to work.

One of the daily papers publishes a babies' section annually through the help of the society. The motive prompting this issue is the selling of advertising space to merchants selling infant supplies, but in order to do so it must have articles on babies' health, which are supplied by the pediatricians. This affords an opportunity to stress the value of inoculation and vaccination and many other things, which makes the issue of mutual benefit to all concerned.

Parent-teacher associations of the different public and parochial schools of the city have been the most consistent bidders for health talks, the calls coming constantly throughout the entire school year. The subjects for these talks have been selected with the idea of giving the mothers health suggestions, which are most appropriate for the ages taught in each particular school. When the parents represent children of the lower grades, toxin-antitoxin, vaccinations and inoculations are discussed in keeping with the program outlined for the year by the Public Relations Committee of the Minnesota State Medical Association. If the audience represents children of high school or junior high school age, goiter and tuberculosis are the subjects most often chosen.

Another consistent avenue for our propaganda, which is open throughout the entire year, is the service or luncheon clubs. The approach is usually made through members who belong to the profession. The program committees of these clubs are constantly on the lookout for speakers and are very easy to approach. The speaker usually talks on some phase of medicine that he is interested in, although at times such subjects as the cost of medical care and periodical health examinations have been used.

At times the demand has become so great that the duties of the committee are rather burdensome. This is especially true when some organization puts on a "Health Week" program and stresses some certain phase of health. Fortunately, in these cases the talks are all on the same subject and prepared material is usually available for the speakers. On one such occasion, we were called upon to supply sixty speakers in one week. The formality of asking our members to supply this request was done away with and they were simply drafted and given assignments. As a tribute to the loyalty of the profession in Duluth, it is only fair to state that the response was one hundred per cent.

The most successful event of our activities was a program sponsored by the Industrial Committee of the Duluth Chamber of Commerce when they gave us one of the five evening meetings sponsored by the committee for the year. The audience consisted of superintendents and foremen from ninety different companies of Duluth and surrounding territory. These men, being superintendents and foremen, were naturally the more alert and intelligent workmen, whose duty was to bring the message back home to the men working under them, which naturally called for very close attention on their part. Those who came from out of the city were given a day's wage, transportation and expenses by their employers. They were assembled in seven different sections, classed according to their special work, and each section was given a forty-five minute talk by members of our local society. The subjects of these talks were chosen with the idea of stressing health hazards most common to the men in the different trades, as, for instance, neglect of common colds being the subject of the talk for the dock and elevator section. Following these sectional meetings, the whole audience was assembled in a hall and was given a forty-five minute talk on "Personal Health and Efficiency" by Dr. W. A. O'Brien of the University of Minnesota. The registration showed an attendance of 960 at this meeting, and these men received the message directly, while thousands received it indirectly through their superiors at their places of work, not to mention the families of these men. We have already been requested to supply speakers for similar meetings next winter.

While we cannot lay claim to anything original in our program, we have definitely demonstrated that there is a demand for information on health and that the public is anxious to get it direct from the medical profession. Doctors have been criticized, and justly so, for being too "close-mouthed." This has left an opening for irregulars and cults, who have not hesitated in handing out their particular brand of wise counsel. In not one single instance has it come to our attention that a cultist or irregular has had an opportunity to speak before an audience in Duluth during the last three years, unless he has rented a hall and advertised for listeners.

In view of our experience it seems to us that it would be profitable for every county society, whether large or small, to have an active committee on public relations, who will stand ready to supply the public demand and supervise the types and nature of information given out. Their experience may be entirely different from ours, depending upon the community and local conditions. Avenues may develop that do not exist here or that we have not recognized, but we are sure that just as soon as the public finds out that the local medical profession has raised the self imposed censorship on their own free advertising, they will invite them to broadcast the merits of their goods and thank them for doing so.

EFFECT OF METHANOL ANTI-FREEZE ON HEALTH

Surgeon General H. S. Cumming of the United States Public Health Service, when asked regarding the statement issued December 6 by the Bureau of Mines on the effect of methanol anti-freeze on health, stated that the Public Health Service had kept in touch with the observations being made by the Bureau of Mines on the subject, and that he felt there was need for the immediate release of information which would protect the general public. It appeared from the study so far that there was much more danger from exhaust gas (carbon-monoxide) than could possibly come from methanol when used strictly as an anti-freeze liquid in automobiles.

The greatest danger is that some one might drink methanol, especially in view of its being used in place of ordinary denatured alcohol as an anti-freeze, and in view of its other name, methyl alcohol. Methanol when taken internally is more certainly poisonous and more highly fatal than any denatured alcohol. According to press accounts, such poisoning has recently occurred in Pennsylvania.

Another danger is in the use of methanol in shellacs which might be applied over considerable surfaces without adequate ventilation. The presence of the coloring matter, as recommended by the Bureau of Mines, and the addition of 23 per cent water as at present dispensed, guard anti-freeze methanol against such dangerous use.

A complete study is advisable as to how far methanol can be used by the general public as an anti-freeze only, and that the precautions advised by the Bureau of Mines be strictly observed.—*Health News*, U. S. Public Health Service.

WOUNDS OF THE THORAX*

Ben F. Davis, M.D.
Duluth, Minnesota

I SHALL confine myself principally to a discussion of penetrating wounds and under this head shall discuss wounds of the heart, pericardium, pleura, and lungs.

HEART AND PERICARDIUM

The heart has been injured by a great variety of objects; while the majority of such objects have entered the heart through the chest wall, wounds of the heart have been produced by objects penetrating from the esophagus, from the bronchi and from the blood stream. The majority of wounds are produced by projectiles, most commonly bullets, although a high percentage are produced by sharp objects; knives, needles and pieces of glass head the list.

It is estimated that patients with wounds of the heart have one chance in ten of spontaneous recovery. Wounds of the right ventricle are more serious than those of the left and wounds of the auricles are more serious than those of the right ventricle. Wounds of the thin-walled auricles do not tend to close. From the left ventricle the blood usually comes in spurts; from the right ventricle and the auricles, in a steady stream. Wounds of the bundle of His are often immediately fatal and wounds of the coronary arteries, proximal to the bifurcation, are fatal and ligation above that point is fatal. Wounds of the heart heal by the formation of scar tissue, not by regeneration of muscle, so that aneurysms in such scars, and spontaneous rupture following strain, frequently occur.

It is estimated that in civil practice at least 60 per cent of all wounds of the heart, not immediately fatal, should be amenable to surgical treatment; that approximately 50 per cent of the patients operated on should recover; that the mortality is about 5 per cent higher for stab wounds than for gunshot wounds and that about 2 per cent of the deaths are due to pulmonary embolism.

Common causes of death in the operated cases are: sudden stoppage of the heart during the operation; infection, which is fairly common, only about 25 per cent of the patients that survive operation being free from infection; and rupture of the scar.

Patients with a wound of the heart usually present an external wound in the precordial area from which blood may or may not be escaping; the pulse is rapid, the blood-pressure is low and tends to fall lower, there is marked precordial distress and dyspnea and the patient may be extremely restless, sometimes tossing about in the wildest manner. In such instances, the pericardium will be full of blood and, if relief is not rapidly given, death will result from pressure on the auricles. It has been shown that when the pressure in the pericardium equals the venous pressure, the heart stops. The average amount of blood in the pericardium in such cases is about 250 grams, although larger amounts up to 500 grams have been described. In other cases the precordial distress is not a prominent symptom, but signs of hemothorax or hemopneumothorax are found. In such instances the pleura has also been opened and the blood escapes from the pericardium into the pleural cavity. *X*-ray examination may be of value if it is quickly available, by showing the rounding out of the pericardial shadow and, in cases of associated wounds of the pleura, showing the changes incident thereto. Most of these cases, however, are urgent and no time should be lost if the radiologist is not at hand. Practically all wounds of the heart should be operated on as soon as the diagnosis is made.

There has been some question with regard to the removal of a foreign body which may be projecting from the wound in the thorax. Needles thus projecting should be removed at once as they are very apt to be drawn into the tissues, to change their location and to be very difficult to find. It is problematic whether to allow other objects to remain in situ until all preparations for operation have been made. Possibly the chances of wound infection would be decreased if such objects were removed at once and further damage to tissues by the foreign body would be prevented. On the other hand, it is conceivable that hemorrhage might be greatly increased and, because this is the great danger early in these cases, we hesitate to do anything that may augment this risk.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 14, 1930.

TECHNIC

Most operations for wounds of the heart may be done under local anesthesia. At times, however, the restlessness of the patient is uncontrollable and in such cases Lockwood[2] recommends "mass ether." In less than one minute the patient is completely relaxed and the operation may be proceeded with.

A great variety of incisions have been suggested. Those of Ollier, Kocher and Mintz, involving, respectively, an incision to, with removal of, the fifth, sixth or seventh left costal cartilage, are frequently chosen. Better approach is afforded by one of the flap operations, with a hinge to the right or left, as preferred by the operator. All of these operations involve the turning up of a flap of the entire thickness of the chest wall, usually including the fourth and fifth costal cartilages, with or without a portion of the corresponding ribs, and, occasionally, a section of the sternum. In other instances, particularly those in which hemothorax exists and it is thought advisable to explore the pleural cavity, the modified Spangaro incision gives excellent exposure. By this incision the fourth and fifth costal cartilages are cut close to the sternum, the thoracic wall is incised in the fifth interspace and the fourth and fifth ribs are widely separated by means of a retractor. This incision gives a good view of the left and right ventricles, the pericardium, and the left pleural cavity. In cases in which a rapid exposure of the heart is not essential, the so-called median-thoraco-abdominal pericardiotomy operation of Duval and Barnsby has been recommended. Briefly, this operation consists in transverse section of the sternum below the angle of Ludwig, longitudinal slitting of the sternum from this point downward carrying the incision two or three inches below the xiphoid into the linea alba. With the pericardium opened and the incision carried inferior to the heart for a short distance through the pericardium and diaphragm, practically the entire heart may be exposed.

When the pericardium is reached, through any of these incisions, it may be split widely and the heart becomes available for examination. In the great majority of instances, the wound of the heart will be found on the anterior surface and immediately two problems arise: (1) the immediate control of hemorrhage; and (2) the control of the excursions of the heart to permit the introduction of sutures. Hemorrhage may best be controlled by placing the finger over the wound and into it if necessary. The matter of steadying the heart for the introduction of the sutures may be quite difficult. It has been recommended that the hand be passed posterior to the heart and that the organ be partially dislocated from the pericardium. This procedure is strongly objected to by recent operators, who feel it is likely to cause permanent arrest of the heart. Lockwood[2] strongly advises the use of the Beck method, according to which a stay-suture is passed through the apex and is held by the thumb and middle fingers of the left hand while the index finger plugs the opening in the ventricle. Interrupted sutures of No. 0 chromic catgut or black silk, carried on fine, non-cutting needles, are then placed in sufficient numbers to control the bleeding and close the wound. The sutures should not enter the cavity of the heart.

It was pointed out long ago that the pericardium and heart do not stand handling as do the pleura and peritoneum. Therefore, sponging with gauze is contraindicated and pads of absorbent cotton, wrung out in warm water, are probably better. An aspirator attached to a suction pump may be used to remove material from the pericardium. Irrigation by any sort of solution produces a serous effusion, with subsequent adhesions, and should be avoided. One curious fact appears, namely, that blood retained within the pericardium seems to be absorbed without the production of adhesions. Drainage should not be employed provided hemorrhage has been completely controlled and excepting in late cases with retained, infected missiles and infection already established. Lockwood[2] advises carrying a double silk suture from the dependent portion of the incision in the pericardium to the surface to act as a guide for the passing of a curved forceps into the pericardium. If such a procedure is not required by the eighth or ninth day, one end of the suture is cut short and the remnant pulled through. If drainage is required, a Penrose drain placed dependently is best. Suture of the edges of the pericardium to the surface for open drainage is advisable in well established infection.

If the pleura has been opened during the operation, it should be hermetically sealed.

Lockwood[2] tabulates the dangers and complications of cardiorraphy for wounds of the heart as follows:

Sudden arrest of the heart.

Jagged, irregular wounds that cannot be approximated.

Tearing of the wound while being sutured.

Hemorrhage that in a certain percentage of cases can hardly be checked.

Infection.

As late post-operative complications he adds:

Adhesions to the pericardium.

Dilatation of the heart.

Dilatation of the heart and adhesions to the pericardium.

Extrasystoles.

An irritable type of heart with recurring tachycardia.

Fortunately, late post-operative complications are uncommon.

LUNGS AND PLEURA

As contrasted to patients with wounds of the heart, most patients with wounds of the lungs and pleura survive long enough to reach the hospital.

The common causes of wounds are: (1) fractured ribs with tearing of the pleura, intercostal vessels or lung by the sharp ends of the rib; (2) penetration by sharp objects; and (3) missiles. The parietal pleura alone may be wounded or the wound may include the intercostal vessels and the lung. Not uncommonly, wounds in the lower part of the thorax traverse the diaphragm and produce intra-abdominal injury.

The signs and symptoms of a wound of the chest may be: (1) slight or no external bleeding, with moderate shock and signs of pneumothorax or hemopneumothorax; (2) external wound with or without external bleeding but with rapidly developing dyspnea, shock, rising dullness in the chest and displacement of the mediastinum; (3) sometimes, with or without cough and spitting of blood, one may see the so-called sucking chest, in which air and blood pass in and out of the wound with the respiratory efforts; and (4), occasionally one may find a patient with increased distension of the affected site with alarming dyspnea, shock and displacement of the mediastinum to the opposite side without dullness, the *x*-ray showing a collapsed lung. With these symptoms there may be signs of peritonitis.

The treatment of wounds of the chest will be guided by the symptoms. It is to be remembered that a wound of the chest causes death by hemorrhage, by asphyxia and by infection, to which may be added syncope, probably due to mediastinal distortion, especially in wounds of the left side. These general points govern the indications for treatment. The difficulties and dangers associated with exploration of the chest and the difficulties of locating the site of internal injury make it advisable that, in general, the treatment should be expectant.

Excluding certain conditions which will be discussed shortly, in dealing with any wound of the chest, irrespective of the agent producing it, the general practice ought to be, to make no exploration; to disinfect the parietal wound and close it immediately; to keep the patient absolutely quiet and under strict observation; and to wait. To these measures we may add, external heat, hypodermoclysis, blood transfusion and morphine as indicated. Absolute quiet is the first requisite for the expectant treatment of thoracic wounds and any departure from this rule is fraught with danger.

Active interference is demanded by: (1) marked hemorrhage, with or without spitting of blood; (2) injury to the diaphragm or signs of peritonitis; (3) increasing distention of the chest with collapsed lung; (4) infection; (5) spreading emphysema.

Brisk external hemorrhage is likely to arise from a wounded intercostal artery. This is best controlled by enlargement of the wound, exposure and subperiosteal removal of the section of rib immediately above the wound to reveal the wounded vessel and to permit ligation of it by two ligatures, one on each side of the site of bleeding. Profuse hemorrhage may come from a wound of the lung and may or may not be associated with spitting of blood. Such hemorrhage demands that the pleura be widely opened and a direct attack be made on the wound in the lung. For this purpose one may lay back a large osteoplastic flap or, better perhaps, make a long intercostal incision and enlarge the opening with a rib spreader, bring the lung to the surface and suture all bleeding points, of which there are frequently more than one.

If, on exploring a wound of the thorax, it is found that the diaphragm has been penetrated, the opening in the latter should be enlarged sufficiently to permit of finger exploration of the sub-diaphragmatic area, and any lesions thus found may be repaired by the same route. Symptoms of peritonitis, namely, abdominal pain and rigidity, appearing quickly after the receipt of a thoracic wound are probably more safely met by laparotomy.

Cases of pressure pneumothorax are more frequently spontaneous in origin than traumatic. Nevertheless traumatic cases are encountered. This demands release of the air pressure within the pleura. This may be obtained by slipping a catheter through a cannula between the ribs and attaching it to a siphon bottle or in one of several other ways which are well standardized.

Infection demands adequate drainage. My preference is for rib resection, evacuation of infected blood clots and exudate, and the introduction of one or more moderate-sized rubber tubes.

Spreading emphysema means that air is being pumped into the tissues at the site of a wound. This condition usually is due to the lung being caught and punctured by the broken rib and held in the wound so that air escaping from the lung is forced along the opened tissue planes. The condition may develop in cases in which air enters the chest through the wound on inspiration but escapes with difficulty on expiration and is deflected into and along tissue planes. Emphysema may spread between pleura and ribs to the mediastinum and there cause serious trouble, or may travel over the body subcutaneously to involve the organs of the neck and endanger life by asphyxia. The remedy is to be found in operation on the wound in the chest.

As in surgery of the heart and pericardium, so with the lung and pleura—a great deal can be accomplished under local infiltration and nerve-block anesthesia. Ethylene anesthesia is quite satisfactory for chest work for the surgeon who does not wish to use local anesthesia. According to Koster and Kasman[1] of Brooklyn spinal anesthesia is entirely practicable for thoracic work and may soon prove to be the anesthetic of choice.

BIBLIOGRAPHY

1. Koster, H. K., and Kasman, L. P.: Spinal anesthesia for the head, neck, and thorax: Its relation to respiratory paralysis. Surg., Gynec. and Obst., 49: 617 (Nov.), 1929.
2. Lockwood, C. M.: Surgery of the pericardium and heart. Arch. Surg., 18:417 (Jan.), 1929.

ALBUTESTA, A PROPRIETARY REAGENT

The A. M. A. Chemical Laboratory reports that Albutesta is a coined name for a chemical reagent to detect albumin in urine. The makers of this product, Menley and James of London, England, and also of New York, have been noted in the past for unscientific proprietaries. One of these is "Iodex," for which the firm has claimed that it contained 5 per cent of free iodin, although the A. M. A. Chemical Laboratory showed, first, that the product did not contain iodin in the free form but in the combined form, and, secondly, that there was less than five per cent of total iodin present. The Laboratory later analyzed the companion proprietary "Liquid Iodex," which was claimed to be a non-irritant preparation of iodin and to contain "free iodine," and found it to contain only about 0.16 per cent free iodin and about three-fifths of the total iodin claimed. The Laboratory found "Albutesta" to be nothing more than a solution of sulphosalicylic acid, a substance well known as a clinical reagent for albumin. The Laboratory points out that while "Albutesta" sells for one dollar, the cost of the ingredients of one ounce of such a solution is about five cents. Since the identity of "Albutesta" is not declared by Manley and James, the Laboratory reminds us that it is almost axiomatic that an analyst must know the composition or definite attributes of reagents he is using if he expects to be at all scientific. (Jour. A. M. A., November 1, 1930, p. 1347.)

HEAD INJURIES*

Winchell McK. Craig, M.D.
Rochester, Minnesota

Head injuries are so variable in severity and effect that only a general, and not a definite, plan of procedure can be outlined for the purpose of diagnosis and treatment. The immediate results of such injuries, although of utmost importance, should not eclipse the consideration of delayed or latent symptoms, which may subsequently become apparent. Certain physiologic and pathologic observations, contributed by neurosurgeons, have been of definite assistance in the improved treatment of patients with head injuries.

At one time, head injuries usually were considered to be severe only if a demonstrable fracture of the skull was present. If a fracture was found, treatment varied with its type and generally consisted of rest, supportive measures, and decompression. This conception of severity of injury was adopted inasmuch as it was thought that the skull, with its rigid structure, acted as a protection to the intracranial contents, and that only a break in the continuity of its walls permitted injury to the underlying brain. But head injuries, with no demonstrable fracture of the skull, produced unconsciousness, aphasia, hemiplegia, altered blood pressure and pulse, and even death. Postmortem examination revealed definite injury to the brain, associated with hemorrhage, both gross and microscopic, not only in the region of the injury, but also in remote regions.

In the search for an explanation of these observations, it was found that the skull was flexible and elastic to a considerable extent and that it yielded, locally or generally, corresponding to the amount of trauma and the manner in which it was received. Such distortion of the intracranial cavity adequately explained the injury to its content, and in the absence of demonstrable fracture it was assumed that the flexibility of the skull prevented a definite break. Consequently, the significance of fracture of the skull in determining the severity of head injuries became modified, and although the presence of a fracture may be considered an index to the violence to which the brain has been subjected, the absence of fracture is not evidence that the skull has not been seriously distorted or the brain injured. Any consideration of head injuries should assume that the injury to the brain and its non-bony coverings is of primary significance, although determination of the presence or absence of a fracture is of interest from a medicolegal standpoint, and extensive linear fractures, particularly of the base of the skull, indicate the seriousness of the situation.

For convenience, acute head injuries are usually clinically divided into three general groups. The first group contains those cases which are relatively mild, in which alarming symptoms do not develop, and in which recovery takes place under expectant treatment. The second group contains the largest and most interesting group of cases. It is considered the most important clinically because it contains the borderline cases, in which the reaction is latent and symptoms develop while the patients are under observation. The third group comprises those cases in which the injury is so severe that the situation appears hopeless from the beginning and death rapidly occurs, in spite of treatment.

In view of the fact that often it is only under careful observation that distinction can be made of cases of these three groups, it is imperative that treatment and observation be closely correlated, and that in all cases, mild or severe, expectant treatment be given. This seems more important when it is realized that the majority of the patients with head injuries of the more serious type suffer from shock which at times masks the underlying injury to the brain. Consequently, in order to determine the extent of the injury, the patient should be put to bed under close surveillance as soon as possible after the accident, and treated for shock if necessary.

The repair of minor cuts and lacerations can be done during the treatment for shock, but any attempt to repair compound fractures and lacerations should be postponed until the general condition of the patient has improved. The pulse, blood pressure, and respiration should be taken and recorded at least every fifteen minutes. After the patient has sufficiently recovered from shock, then any radical surgical procedures can be performed, and more detailed examinations, including roentgenologic, can be made.

---

*From the Section on Neurologic Surgery, The Mayo Clinic, Rochester, Minn. Read before the Minnesota State Medical Association, Duluth, July 14 to 16, 1930.

When lacerations of the scalp and compound fractures of the skull have occurred, the area involved should be carefully shaved, the ragged edges of the scalp should be trimmed, and the wound should be swabbed out with tincture of iodine, or a similar antiseptic preparation. After removal of any foreign material and contaminated fragments of bone from the wound, iodine should be applied to the dura and cortex, and capillary bleeding should be controlled. Following this, the skin should be loosely closed with sutures of silk or silkworm gut.

Increased intracranial pressure, after trauma, usually begins a few hours after the period of shock is over and forms a serious complication in head injuries. For this reason, treatment should be directed toward its relief, and in view of the fact that increased intracranial pressure may be caused by either cerebral edema, or intracranial hemorrhage, conservative methods of treatment are advisable until there are definite indications for operation. Edema is a physiologic reaction on the part of any traumatized tissue of the body, and since the skull acts as a capsule of constant volume, preventing expansion of the brain when traumatized, two conservative methods of treatment can be used for the relief of subsequent intracranial tension. The first consists in the drainage of the cerebrospinal fluid from the subarachnoid space, by spinal puncture, which relieves the pressure within the cerebral ventricles. Formerly, this was thought to be a rather dangerous procedure because it tended to increase intracranial hemorrhage, if present, but following the observations of Bagley, who demonstrated the irritative action of blood on the meninges, any danger associated with drainage has been seen to be less than its beneficial effects. Spinal drainage should be repeated when it is followed by improvement and when, in the course of a single puncture, the fluid becomes clear after first being hemorrhagic.

The second conservative measure consists of intravenous administration of hypertonic fluids, which aids in lowering the intracranial pressure. Fay not only advised intravenous injection of 50 c.c. of solution of glucose, 50 per cent, but also suggested that the intake of fluid be restricted to 26 ounces (800 c.c.) in twenty-four hours. If rapid pulse indicates that more fluids are necessary, glucose, 20 per cent, in physiologic solution of sodium chloride, can be given intravenously in amounts up to 500 c.c., and oral intake of fluid can be increased. Administration of magnesium sulphate further aids toward cerebral dehydration and reduction of intracranial pressure, and, when the patient is conscious, should be given by mouth in doses of 1½ ounces (45 gm.). When the patient is unconscious, administration should be by rectum in doses of 3 ounces (90 gm.) in 4 fluid ounces (120 c.c.) of water.

If the patient continues to exhibit symptoms of increased intracranial pressure, such as stupor, slow pulse, and elevated blood pressure, then decompression may be considered. If localizing signs cannot be elicited by careful neurologic examination, right subtemporal decompression may be done. Linear fractures, without accompanying paralysis, rarely require exploration. However, extensive depressions in the skull should be elevated, and the fragments should be retained and held in place by the scalp, in the absence of external lacerations. Plastic operations to relieve depressions of the skull in the presence of infected wounds should be postponed until all evidence of infection has disappeared. Antitetanic serum should be administered when lacerations have occurred.

Middle meningeal hemorrhage may not become evident until apparent recovery from acute head injuries has taken place, and it may follow even mild trauma. Consequently, careful observation and repeated neurologic examinations are imperative in all suspected cases. Slowly developing intracranial pressure, accompanied by hemiplegia, jacksonian attacks, changes in reflexes, or similar localizing symptoms, usually indicate the presence of hemorrhage. Besides other localizing manifestations, Jefferson has called attention to bilateral rigidity as a diagnostic sign in the presence of middle meningeal hemorrhage. Following the development of localized compression and the diagnosis of intracranial hemorrhage, operation should be performed to arrest the bleeding and to remove the associated blood clot.

In the treatment of acute head injuries, it is necessary to consider the fact that in some cases of relatively mild injuries unpleasant sequelæ develop at a later period. These consist of intermittent headaches, irritability, loss of concentration, of memory, of judgment, of ambition, and even convulsive disorders. Repeated neurologic examinations often fail to reveal any evidence of altered function, and a diagnosis may be made of posttraumatic neurosis, hysteria, neurasthenia, and even of malingering.

Following the introduction of air into the subarachnoid space and ventricles by Dandy, it has been possible to study such cases by means of ventriculography and encephalography. Roentgenograms of the head give evidence that some of these patients have a definite pathologic lesion, consisting of atrophy of the brain, involving chiefly the frontal and parietal lobes. This has come to be regarded as atrophy due to pressure which, in turn, is caused by a disturbance in the mechanism by which cerebrospinal fluid is eliminated. Normally, physiologic balance exists between the secreting mechanism of the cerebrospinal fluid, or the choroid plexus, and the eliminating mechanism, or the subarachnoid villi and pacchionian bodies. The meningeal irritation resulting from blood in the cerebrospinal fluid following trauma has been referred to. Bagley carried out experiments and made clinical observations which proved that the irritative effects have a tendency to disturb this balance by interfering with elimination of cerebrospinal fluid. As a result, it is believed that, following head injuries, there occurs an accumulation of fluid over the cortex, with subsequent atrophy of the brain. Owing to this fact, it is possible to demonstrate, by means of encephalography, any atrophy of the brain associated with the so-called posttraumatic syndrome. Penfield has advocated the use of insufflation of air as a therapeutic measure in cases of chronic head injury, and some of the posttraumatic headaches have been relieved by this method. At the time of the insufflation, Penfield has roentgenograms made, and on the basis of what they reveal he gives tentative prognosis and gains ideas which can be employed in future treatment.

There is a relatively small group of patients with head injuries in whom latent symptoms develop after an interval of weeks, and sometimes of months, and the injury may be so insignificant that it is omitted from the history. The usual clinical picture consists of a slowly developing rise in intracranial pressure, with few, if any, localizing signs. These patients may go on to coma and death. The underlying cause is the formation of a chronic subdural hematoma or organizing hemorrhage beneath the dura. A correct diagnosis is difficult and ventriculography or exploratory craniotomy is sometimes necessary to reveal the nature of the lesion. The removal of the hematoma results in prompt recovery, and for this reason in every case of head injury in which late symptoms of increased intracranial pressure develop, hematoma should be considered.

In the treatment of old head injuries, it is often necessary to decide whether plastic operation should be carried out. This is especially true when depressed fractures have occurred or when defects in the skull exist as a result of a previous operation. The use of encephalography may demonstrate associated atrophy of the brain, in which case the symptoms will not be relieved by repair of the defect or by elevation of the depressed bone. Even in the absence of atrophy of the brain, a small defect within the hairline, which has not produced symptoms, should probably be left alone. Larger defects in the skull usually are repaired by means of either the Koenig-Müller osteogenic flap, consisting of the periosteum and the outer table of an adjacent area of bone or implanatation of a celloidin plate. Either of these procedures is more satisfactory than the insertion of a silver plate. Deformity of the frontal bone is usually repaired by transplantation of a portion of a rib. In chronic cases, when operation offers little, if any, relief, patients should be advised regarding a change in environment and occupation; they should be encouraged to occupy their time in light work and gradually to increase their activities. Sedatives can be given when necessary and the intake of fluid restricted. With proper adjustment and encouragement, such patients often improve and ultimately recover.

SUMMARY

Head injuries respond to treatment in proportion to the injury to the brain.

Fracture of the skull, although indicative of the severity of the injury in some cases, does not always occur even in the more severe types of head injury, due to the flexibility of the bones of the skull.

Radical surgical treatment should be delayed until the patient has recovered from shock, although minor lacerations can be cared for while shock is being treated.

Spinal drainage should be effected to relieve increased intracranial pressure and to remove hemorrhagic spinal fluid which may irritate the meninges and contribute to the posttraumatic sequelæ.

Dehydration by means of intravenous hypertonic solution, oral and rectal administration of magnesium sulphate, and restriction of intake of fluid, controls the increase of intracranial pressure, may obviate the necessity for surgical intervention, and tends to prevent the development of latent symptoms.

Encephalography is of value not only in diagnosing the presence of organic changes in the brain, but the insufflation of air that the procedure entails tends to relieve posttraumatic headache.

Surgical repair of old injuries to the skull should be done only in the absence of any organic change in the brain, and the operations of choice are the Koenig-Müller graft, insertion of a celloidin plate, or transplantation of a portion of a rib.

BIBLIOGRAPHY

1. Bagley, Charles, Jr.: Blood in the cerebrospinal fluid: Resultant functional and organic alterations in the central nervous system. Arch. Surg., 17:18-81 (July), 1928.
2. Dandy, W. E.: Röntgenography of the brain after the injection of air into the spinal canal. Ann. Surg., 70:397-403 (Oct.), 1919.
3. Fay, Temple: Generalized pressure atrophy of the brain secondary to traumatic and pathologic involvement of pacchionian bodies. Jour. Am. Med. Assn., 94:245-249 (Jan. 25), 1930.
4. Jefferson, Geoffrey: Bilateral rigidity in middle meningeal hemorrhage. Brit. Med. Jour., 2:683-685 (Oct.), 1921.
5. Penfield, Wilder: Chronic meningeal (post-traumatic) headache and its specific treatment by lumbar air insufflation; encephalography. Surg., Gynec., and Obst., 45:747-759 (Nov.), 1927.

NEW NAMES FOR OLD UNACCEPTABLE PROPRIETARY PRODUCTS

The Southwest Medical Supply Company sends out advertising for "Onolin," "Aritine," "Amazine" and "Lesol." Those who read a recent discussion, "The Horovitz Proteins and Lipoids Again," will recognize in the products named the ill concealed names of Gonolin, Arthritine, Asthmazine and Luesol. Here is a group of the various names under which the Horovitz proteins and lipoids are marketed by various firms. The advertising circulars that are sent for one group are the same (except for the name of the product) as those sent for the other group, the genealogy of which has been traced from the original Horovitz mixtures, through the Merrell Proteogens, to the present products of the Lipoidal Laboratories, Inc. The advertising for each is a farrago of pseudoscience. (Jour. A. M. A., December 20, 1930, p. 1933.)

SOMNOFORM

Yandell Henderson writes that he has recently received from the Stratford-Cookson Co. an advertisement of "Somnoform," stated to have the formula: chloride of ethyl, 83 per cent; chloride of methyl, 16 per cent; bromide of ethyl, 1 per cent. Henderson believes that if the claim is true that "the record of Somnoform for safety is without equal," the record must be regarded as a pure piece of good fortune, for two at least of the ingredients have a toxicity which renders them unfit for use as anesthetics. In 1919 the Council on Pharmacy and Chemistry declared Somnoform inadmissible to New and Non-official Remedies because in the absence of acceptable evidence showing its exceptional safety and value, the claims made for it were held to be unwarranted and because the name of the mixture is not descriptive of its composition. (Jour. A. M. A., November 8, 1930, p. 1445.)

THE DAVIS TREATMENT OF COMPRESSION FRACTURES OF THE SPINE WITH A SUGGESTED METHOD IN DISLOCATIONS*

EDWARD T. EVANS, M.D.
Minneapolis

THE daily increase in the dangers to which our civilian population is exposed has resulted in a corresponding increase in traumatic surgery. The public is demanding more and more the ultimum in the treatment of these injuries, and the failure of members of the profession to acquaint themselves with and to grasp the improvements in fracture treatment will react to their detriment.

Up to the time of the *x*-ray, a spinal injury, if recognized as neurological, was treated in many instances as an almost fatal condition. Without neurological signs, it often went untreated with good, bad or indifferent results and the situation was clouded by the pessimistic attitude of the profession and layman.

Within the past ten years conditions have improved markedly. Rational treatment, often life saving in effect, has marked the severe injuries. C. C. Coleman of Richmond, Virginia, contributed a real advance in the early diagnosis of cord block when he advocated Ayres technic of double spinal puncture as a routine in the neurological cases of fractures and Neffziger summarized the indications for radical surgical treatment before the Pacific Northwest Medical Association in January, 1927.

But the cases with neurological signs are in the minority; 60 to 80 per cent of fractured spines are of the compression type.

Osgood states that 70 to 80 per cent of these compression fractures lie between the eleventh dorsal and second lumbar vertebra, with the region from the fifth cervical to the fourth dorsal following in frequency. The occurrence of double lesions must not be overlooked.

In 1923, Wallace, recognizing the inadequacy of flat bed or ambulatory brace treatment, made a distinct contribution to the prevention of increasing deformity, so common after these cases, when he advocated traction upon the hyperextended frame.

In 1924, I treated three cases of severe compression fracture with lamina injury and paralysis by constant hyperextension of the patient over a taut sheet. My notes remark that on the fifth day no kyphos was palpable in one of the cases and the *x*-ray reported a diminished impaction, but I failed to appreciate what had occurred and did not fix the patient in hyperextension and the end-result was mechanically poor and the kyphos recurred, though the paralysis cleared up completely. No diminution in kyphos was apparent in the other two, though my hyperextension was quite extreme (Fig. 1).

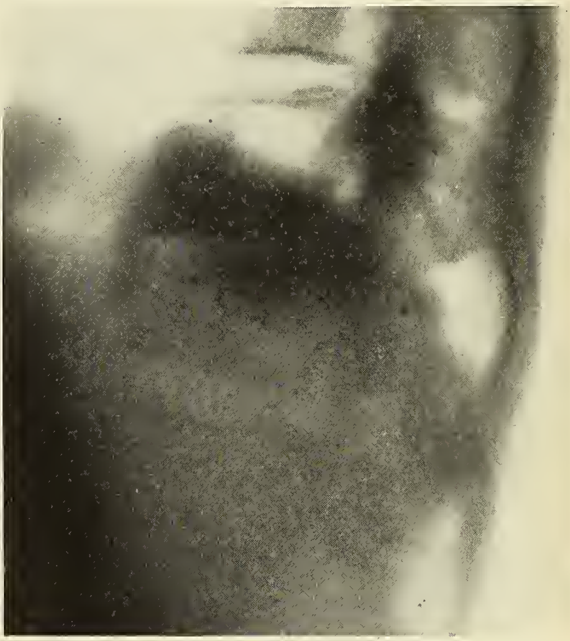


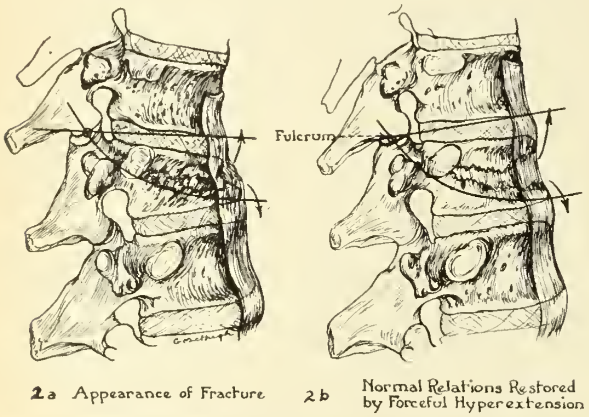
Fig. 1. Typical result in unreduced cases.

In April, 1928, J. E. M. Thomson reported a case in which he applied plaster in prone hyperextension on the hammock. His *x*-ray shows improvement. A. Thomas reports the end-results in 100 cases treated by hyperextension, according to the Wallace method, with the usual high percentage of disability, and no recorded reductions.

---

*Delivered in part before the Great Northern Railway Surgeons at Seattle, Washington, July 2, 1929, and in full before the Minnesota State Medical Association at Duluth, Minnesota, July 14, 1930.

Eikenbarry of Seattle stated that not more than 5 per cent of his series returned to hard labor without considerable permanent disability. H. I. Johnson reports that most of his series ran from 60 to 70 per cent permanent disability. Cases summarized by Dr. Kuth of Duluth, showed a lower disability but enough cases of high disability in simple compression to make one pause and ask if our treatment has been sufficient.



2a Appearance of Fracture

2b Normal Relations Restored by Forceful Hyperextension

Fig 2.

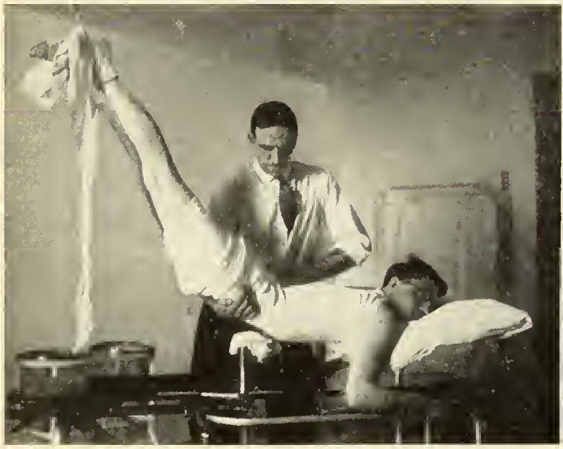


Fig. 3.

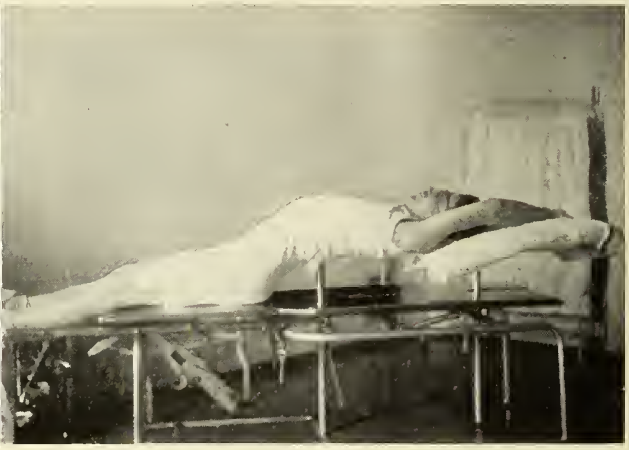


Fig. 4.

The compensation angle must be recognized as an economic factor in these cases. It is a well known fact that the private patient recovers quite rapidly from the simple compression fracture, whereas the industrial case is less prone to do so. Two factors account for this. First, the uniformly heavier type of labor necessitating full function of the spine. Second, the dependence, conscious or subconscious, on compensation until all subjective symptoms disappear, often prolonging disability until long after objective findings are gone. We must confess that the functional and static condition of the spine is disturbed with resultant osteoarthritis, a common sequela; and too often the industrial commissions base their rating on the *x*-ray findings.

Arthur Davis of Erie, Pennsylvania, in his American Orthopedic Association thesis, contributed the greatest single advance in the treatment of this type of case in the use of hyperextension with forcible manipulation. He applies rational and sufficient mechanical leverage to reduce the compression by reversing the forces producing the fracture. Rogers of Boston has accomplished the same by means of an adjustable hyperextension frame, but this, I believe, calls for special apparatus, requires more time and is more painful, though probably indicated in certain severe comminuted fractures.

The vertebral body is spongy bone throughout, except the superior and inferior plates, which are of compact bone and which form from separate epiphyses at about the twelfth to fourteenth years and fuse to the body at the twentieth to twenty-fourth years. The bodies are separated from each other by intervertebral discs sufficiently elastic in structure to withstand considerable trauma. They are joined by the long, medium and short common ligaments, attaching to the superior and inferior plates. In the production of the compression, they are almost always left intact, the intervertebral disc seldom shows early narrowing and the compression occurs in the spongy bone. Mechanically there is no reason to suppose extensive injury of the ligaments in the compression unless the plates are fractured or an explosive comminution occurs. The usual kyphos results and often signs of cord irritation or compression are present. The laminæ are usually not fractured, the transverse articulations remain intact, and the pedicles are, as a rule, united with the inferior fragment (Fig. 2a).

Reduction utilizes the mechanical principle of leverage accomplished by hyperextension and the application of sufficient force at the fulcrum to reduce the fracture by the attendant traction on the common ligaments attached to the plates (Fig. 2b).

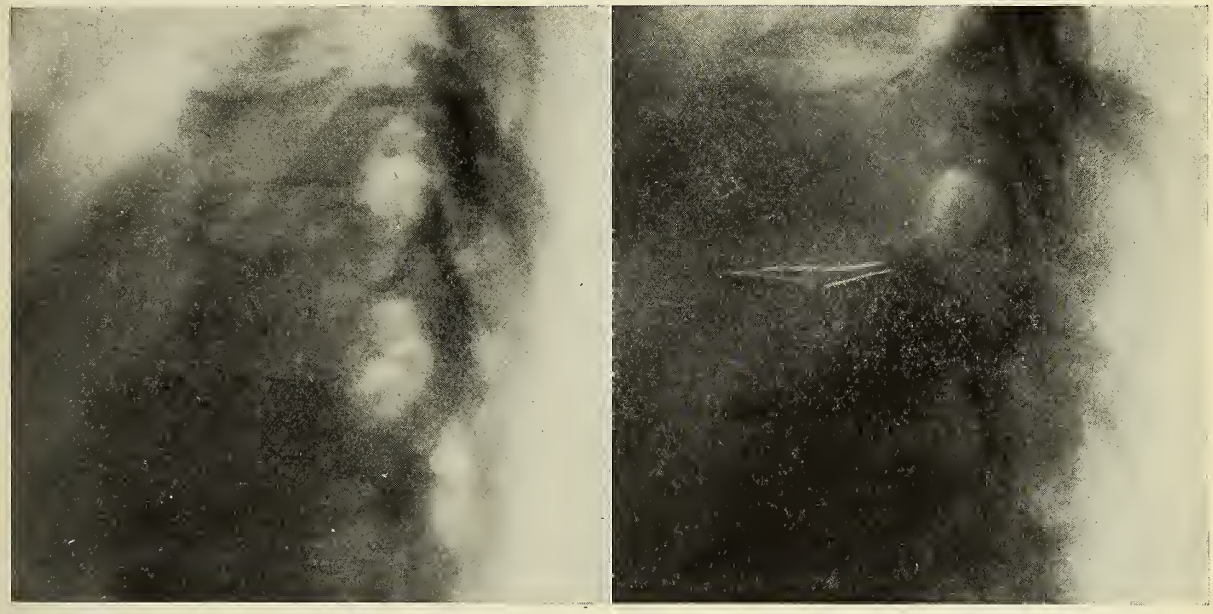


Fig. 5. Case 1. Before reduction and after reduction.

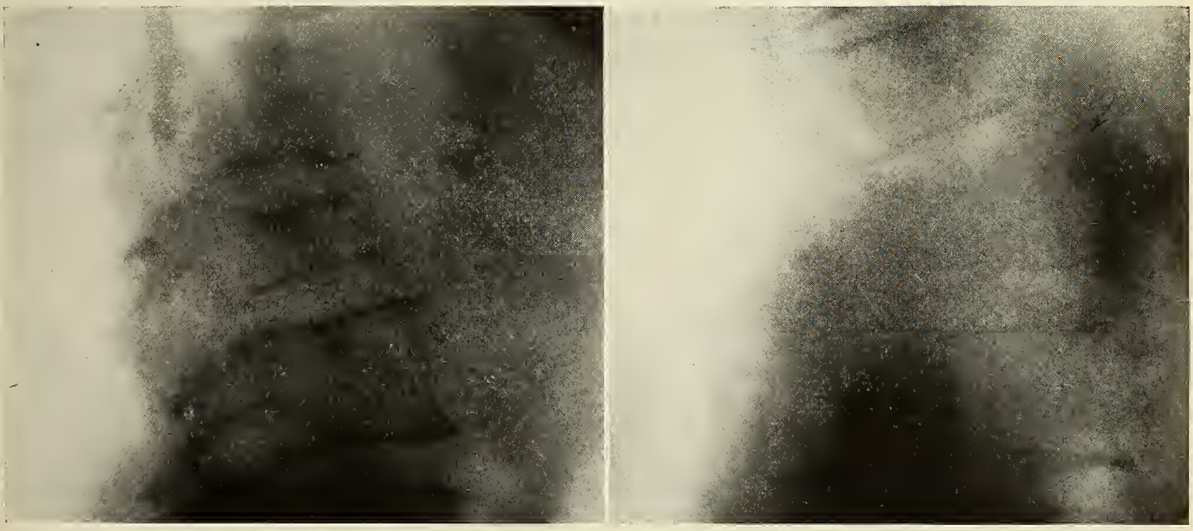


Fig. 6. Case 2. Before reduction and after reduction.

In determining this, good roentgenograms are essential. There is no need for me to urge the importance of anteroposterior and lateral roentgenograms in all back injuries. The awakening public expects them, the compensation boards demand them, and they are your insurance against malpractice action and the patient's for proper and adequate treatment.

The indicated treatment of a compression fracture of the vertebra should be the same as for any other fracture: (1) reduction adequate and immediate; (2) fixation in the reduced position until healing has occurred, and (3) the restoration of function. The case for compression fracture cannot, however, be so simply stated. A careful evaluation of the possible contraindica-

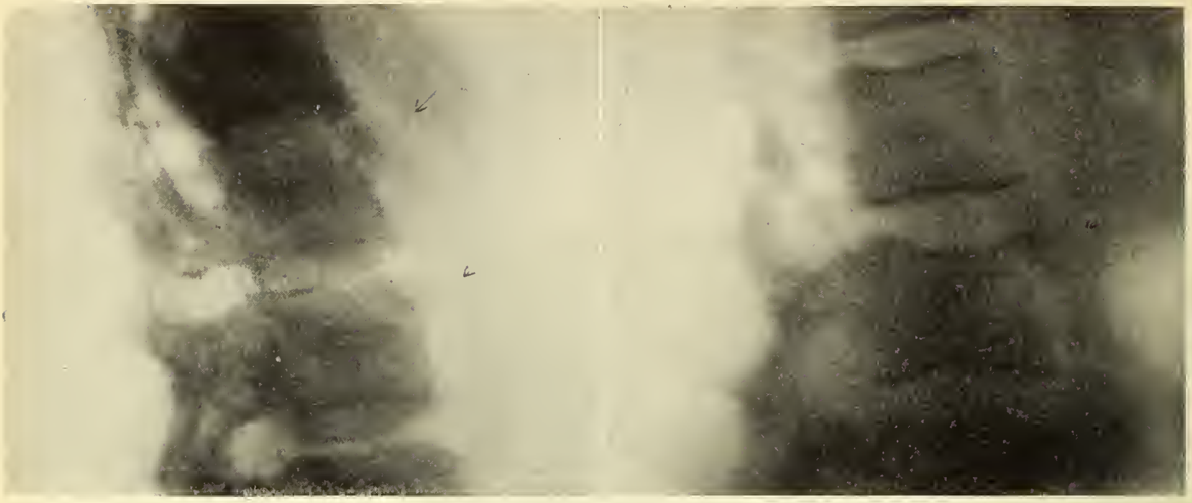


Fig. 7. Case 3. Before reduction and after reduction.

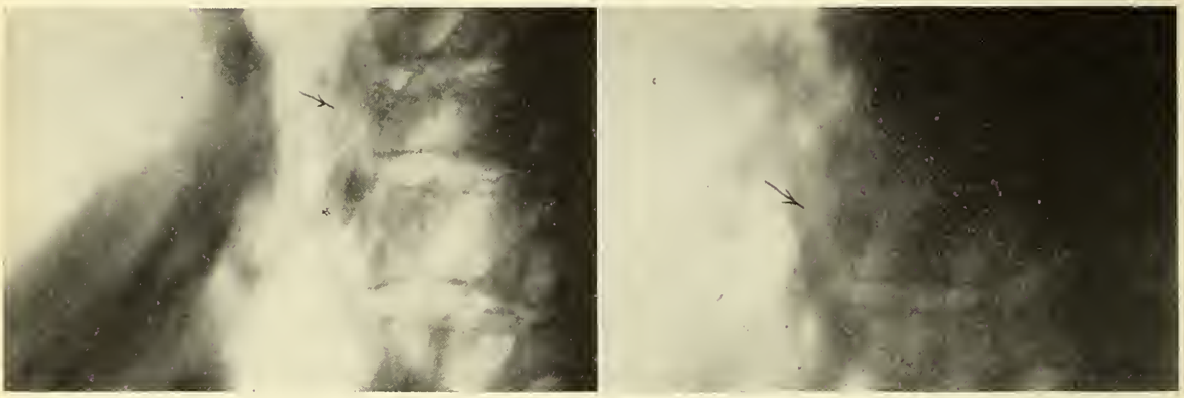


Fig. 8. Case 4. Before reduction and after reduction, showing the difficulty of fully reducing thoracic vertebra because of rigidity of the rib cage.

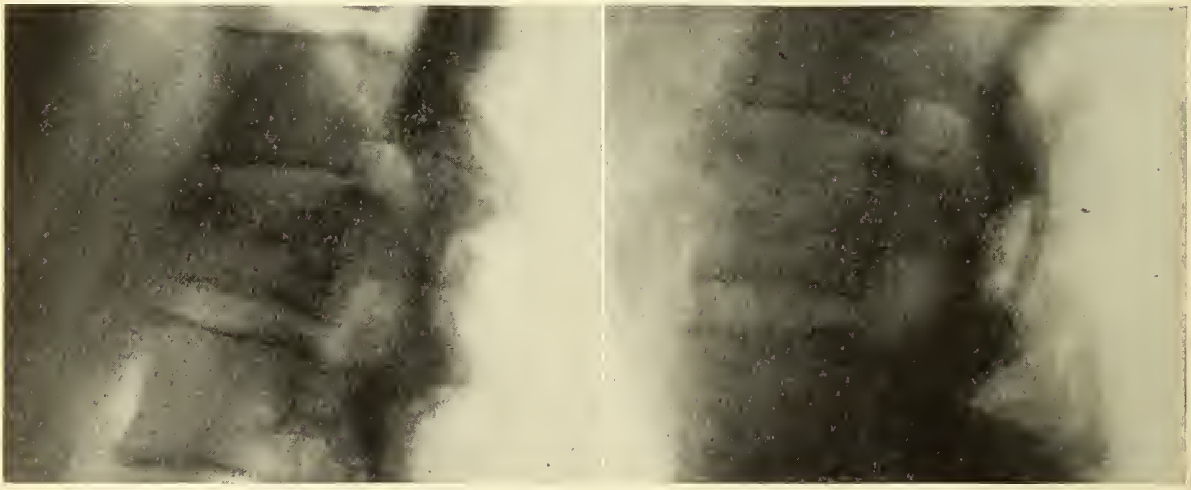


Fig. 9. Case 5. Before reduction and after reduction.

tions is essential. These may be classed as general, neurological, and anatomical. The age of the patient, together with the presence of shock or other attendant complications, might definitely contraindicate the use of this procedure, necessitating as it does prolonged confinement in a retention apparatus, although the patient may be turned frequently immediately after the application of the plaster jacket and allowed to sit up with support after the sixth week, providing that support is adequate. The judgment of the attendant surgeon must be exercised under such conditions. Remember, however, that the patient is more comfortable if the fracture is reduced and adequately supported. Neurological complications may contraindicate the use of this method because of their relatively greater importance. Thus, a laminectomy may be the first indication although, here, reduction may relieve a compression cord block and laminectomy may, in certain cases, be deferred without endangering the clinical course of the case. The paralysis may be so severe that a hopeless prognosis is evident, in which case it would be folly to subject the patient to treatment directed toward the fracture. I believe that the above are problems which must be decided in the individual cases and that the true criteria for reduction lie in the anatomical condition of the parts. If, after a study of good roentgenograms, it is evident that the neural arch of the pedicles is fractured or that there is fracture or dislocation in the region of the transverse articulations, there is obviously instability of the fulcrum and an attempted reduction by the Davis method would be quite dangerous and liable to produce further cord trauma. Here, if the apparatus is available, Rogers' method might be used to advantage. If, however, the anatomical relationships of the transverse articulations and the pedicles of the fractured vertebra and its neighboring vertebræ are normal, the possibility of cord injury during the manipulation is reduced to a minimum.

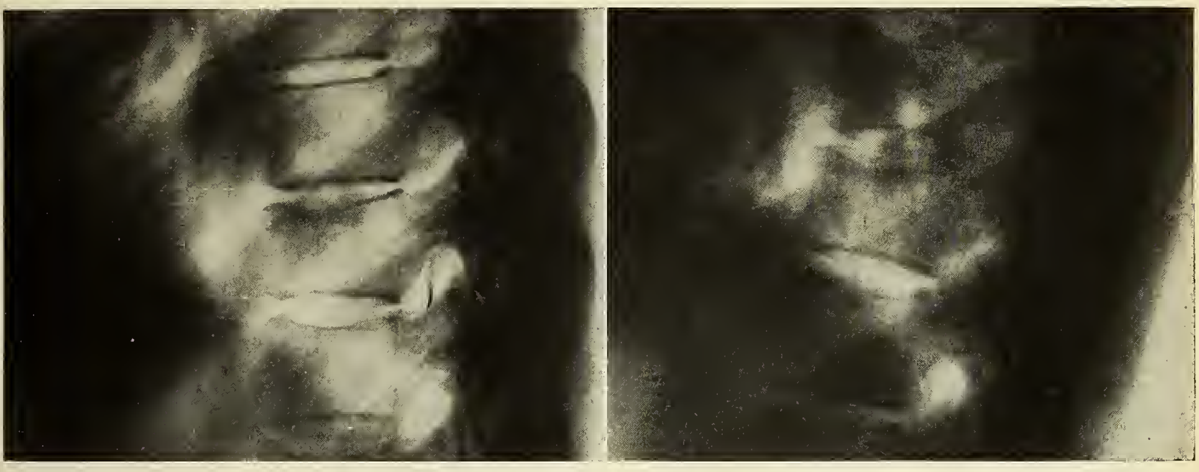


Fig. 10. Case 6. Before reduction and after reduction.

Reduction is best accomplished by putting the patient under deep anesthesia for complete relaxation and hyperextending him into a swan-dive position, by suspension of the body from the feet with the chest supported. The operator's right arm is then placed under the pelvis at the anterior superior spines (for support), and gradually increasing force is applied to the kyphos by the left hand until complete realignment is palpable (Fig. 3). A snug-fitting plaster jacket with only slight padding is immediately applied from groins to axillæ. At this point the patient may become cyanotic, due to the inverted position, and the plaster must be applied rapidly, although early use of a pharyngeal air-way usually prevents this. As soon as partial setting occurs, the suspending rope is cut, the patient supported in complete hyperextension and turned over so that the kyphos area rests on a padded pelvic support (Fig. 4).

It is not essential to include the thighs in plaster, as the ligaments hold the disimpaction if the plaster is moulded snugly to the chest and pelvis and it is here that I have modified the Davis method. In my experience there is no difficulty in obtaining the coöperation of the patient in keeping the thighs extended, rather than having them encased in plaster. The corset is worn in bed six weeks, the patient is turned frequently and allowed up in the jacket at the end of that time. At ten weeks a snug-fitting Taylor-Goldthwaite brace is applied, to be worn day and night for four to six months more, after which time it is gradually removed. The light spring steel type of brace is best, as it does not tend to produce such extreme atrophy of disuse or stiffness of the spinal muscles.

CASE REPORTS

Case 1.—D. C., male, aged 19, aviator. Compression fracture of the eleventh thoracic vertebra (Fig. 5).

Case 2.—A. S., housewife, aged 53. Compression fracture of the second lumbar vertebra, with compression spasticity. Immediate disappearance of spasticity after reduction (Fig. 6).

Case 3.—M. H., aged 34, stenographer. Compression fracture of the twelfth thoracic and first lumbar vertebræ (Fig. 7).

Case 4.—O. N., aged 46, farmer. Compression fracture of the eighth thoracic vertebra in an automobile accident. This case illustrated the difficulty of reducing thoracic vertebra compression because of the rigidity of the rib cage (Fig. 8).

Case 5.—B. G., aged 26, clerk. Compression fracture of the second lumbar vertebra from an automobile accident (Fig. 9).

Case 6.—D. B. Compression fracture of the tenth and eleventh thoracic vertebræ (Fig. 10).

Case 7.—O. P., aged 34, farmer. Fracture dislocation of the fifth and sixth thoracic vertebræ with compression of the fifth resulting from an automobile accident (Fig. 11). This patient had a subsequent laminectomy without improvement and died of ascending pyelonephrosis.

Case 8.—C. C., aged 46, steel crane operator. Comminuted compression fracture of the second lumbar and fracture of all the transverse processes. Treated by hyperextended frame after method of Rogers of Boston with complete reduction. Returned to light duty in five and a half months.

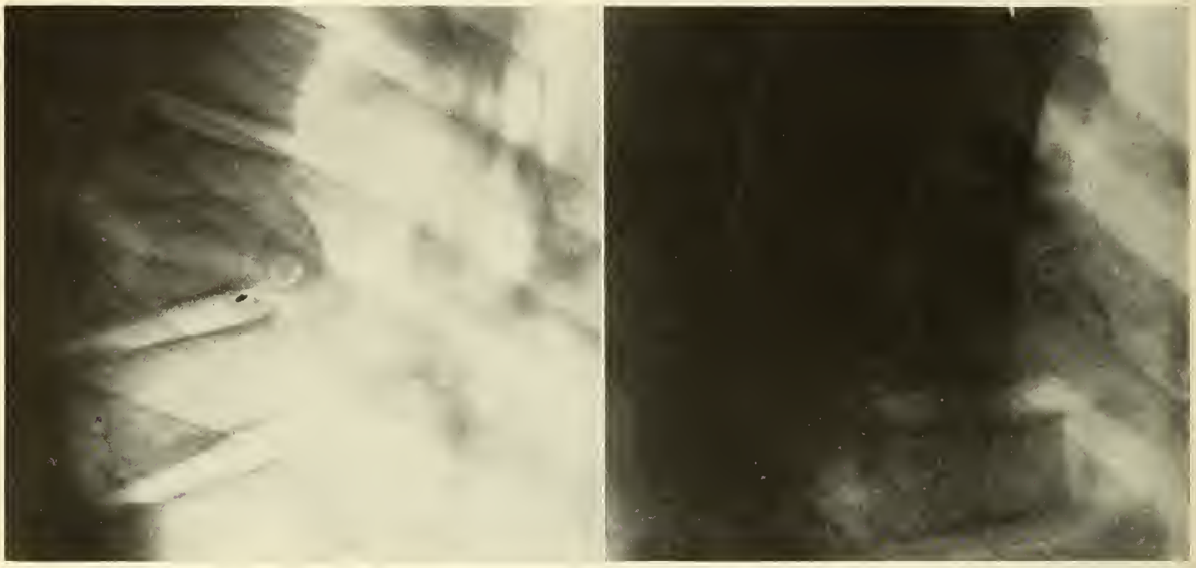


Fig. 11. Case 7. Before reduction and after partial reduction.

Case 9.—J. R., aged 35, elevator construction engineer. Compression fracture of the first lumbar vertebræ. Treated by active hyperextension with adequate reduction. Returned to light duty after the fifth month.

Case 10.—M. O'D., aged 40, nurse. Compression fracture of the twelfth thoracic and first lumbar vertebræ from an automobile accident. Treated by active hyperextension with over-correction. Returned to light duty, wearing brace, the twelfth week.

All the living patients have returned to active duty, excepting in cases 8, 9, and 10, where they are still convalescing but ambulatory with a brace. In no case has the brace been worn for more than six months. Davis reports an average disability of fourteen weeks in a series of thirteen cases but a longer period of adequate support would seem advisable to prevent recurring deformity.

FRACTURE DISLOCATIONS OF THE SPINE

There are those severe types of fractured laminæ and transverse articulations in which there is a marked dislocation of the spine.

As a student, I was fortunate enough to see the manual reduction of a dislocation of a dorsal vertebra after traction had been applied continuously for some six weeks. Four years ago while assisting Dr. Sneed at the Hospital for the Ruptured and Crippled in New York, we effected a partial reduction of a fracture dislocation of the first lumbar vertebra. Since that time, I have attempted to reduce two cases by a modification of the procedure used in New York, without definite result. Davis mentions manipulative reduction of these cases in his article, implying the use of the same method described above. Despite the fact that the results with my cases have been poor, I do not feel that, in the presence of fractured pedicles or transverse articulations, it is safe to apply hyperextension, nor to use that haphazard method recently advocated by Dunlap of Los Angeles. Figure 12 shows the method I would suggest as a procedure definitely safer and rational in its application. My failure to reduce the first two patients was due, I believe, to the fact that I over-estimated the strength of the spinal muscles in that I thought it was necessary to apply head and foot traction for four and five weeks, respectively, with resultant callus formation. I now feel that reduction should be attempted in the suitable or otherwise hopelessly unstable case as soon after the injury as possible and wish to suggest the procedure at this time.

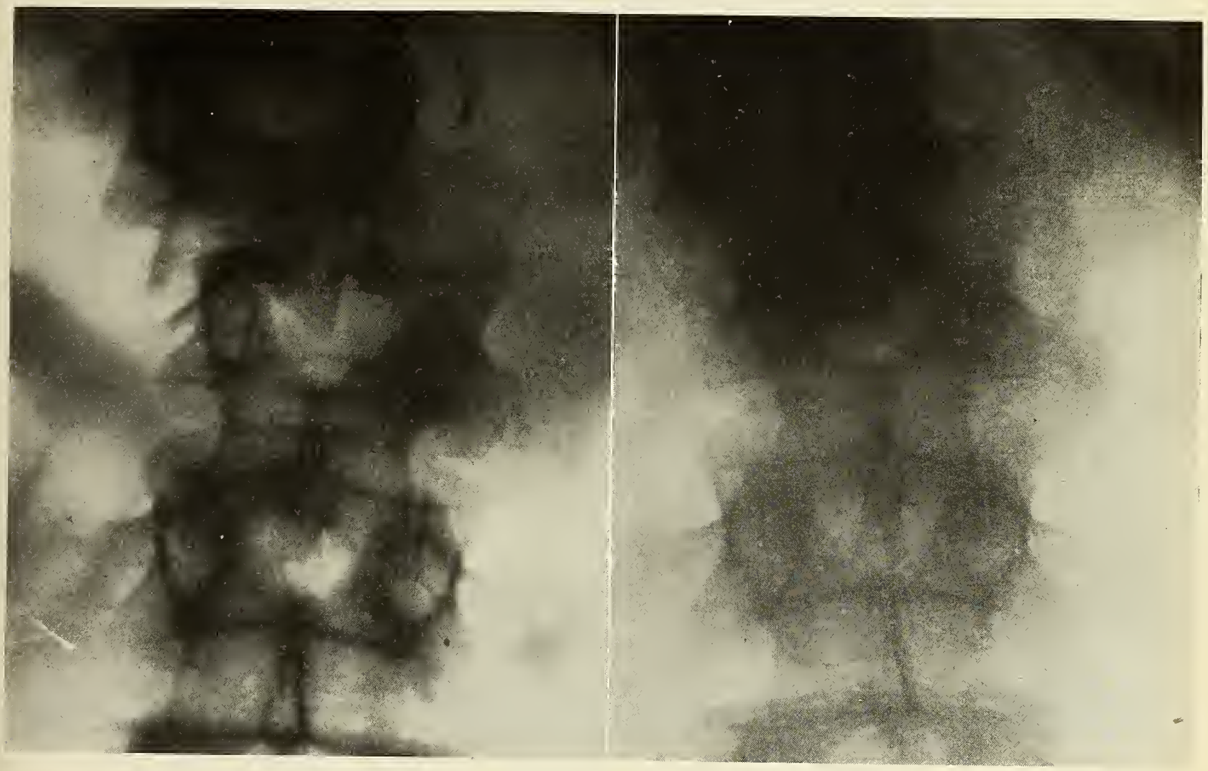


Fig. 13. Case 11. Before reduction and after partial reduction.

Case 11.—L. D., patrolman. Fracture dislocation of the second lumbar vertebra in an automobile accident. Figure 13 shows condition before and after attempted reduction with slight improvement.

CONCLUSIONS

1. The Arthur Davis method of reducing compression fractures of the spine is advocated in suitable cases as mechanically sound, a clinical improvement of economic value over older methods.

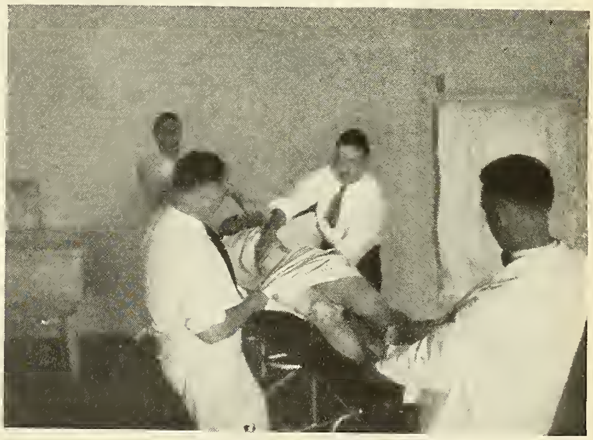


Fig. 12. Method of manipulating cases of fracture dislocation.

2. The indications and contraindications are outlined.

3. Ten further cases are added to the literature.

4. A manipulative method of treatment is suggested in severe fracture dislocations with report of two cases.

TREATMENT OF TETANUS AND GAS GANGRENE*

M. H. Manson, M.D.
Minneapolis

GAS gangrene and tetanus are both comparatively rare conditions encountered in any one surgical experience, but because of their dramatic course and high mortality deserve continued effort directed to their prophylaxis and treatment.

It is appropriate that gas gangrene and tetanus be considered together, for they have many points of similarity. The following are common to both:

1. Initiation by anaërobic, spore-forming bacilli.
2. Dependency, to some extent, on symbiosis with other organisms.
3. Result of wounds contaminated with dirt and foreign bodies.
4. Characterized by toxins, for which antitoxins have been produced which are efficient in neutralizing the toxins.
5. Accompanied by an excessively high mortality rate, approximately 50 per cent.

Their infrequent appearance complicating traumatic and operative wounds is due to the multiplicity of bacteriological and tissue factors necessary for their development, and the accepted usage and efficacy of prophylactic tetanus antitoxin. This statement may in part be challenged, in view of Wainwright's report on the 584 replies to a questionnaire on tetanus which he received from surgeons throughout the country. Of this number, only 83, or 14 per cent, employed prophylactic antitetanus serum as a routine procedure. However, these represent an industrial group and, as it has been pointed out that 80 per cent of the entire incidence of tetanus arises in uncontrollable circumstances such as wounds contaminated with debris or soil from the street, garden, stable, and farm, the use of anti-tetanus serum in this state is probably more prevalent.

INCIDENCE

The frequency of tetanus in civil practice is difficult to determine, but the incidence in wartime is interesting and demonstrates again the value of antitoxin. Cornwall, 1917 (New York Medical Journal) gives the following statistics:

	Wounded	Cases	Per 1,000
Crimean War	12,092 (English)	9	1.5
American Civil War	217,000	505	2.0
Franco-Prussian War	95,000	350	3.5
World War	27,677 (German)	174	6.6

thus showing an apparent increase.

These are undoubtedly figures for the early part of the World War. The incidence of tetanus in the British Army in October, 1914, was 32 per 1,000, and after the universal use of antitetanic sera the ratio was cut down to 2 per 1,000. The good fortune of the United States in profiting by the experience of the Allies is exemplified in the ratio of 0.014 cases of tetanus per 1,000 battle injuries—only 36 cases associated with 176,132 injuries.

MORTALITY

That the mortality in tetanus varies inversely to the incubation period is well known. A long incubation period goes hand in hand with a low mortality. Prophylactic injections of antitoxin prolong the incubation period, as shown in the following:

During the war in 1914-15, the average incubation period was 13.4 days; in 1915-16, 31.2 days, and in 1917-18, 46.19 days. With the progression of the war, there was an increase in multiple injections of antitoxin.

The mortality of established tetanus is from 40 to 70 per cent. The virulence of the organism influenced by season and location, the incubation period, the site of the injury and the treatment are all factors determining the death rate.

PROGNOSIS

The prognosis, as judged from the mortality rate, must be very guarded. The best prognosis is offered when the incubation period is long; arbitrarily, longer than 10 days; when the wound is farther away from the central nervous system; when prophylactic tetanus antitoxin has been given; and when the antitoxin is given early after the onset of symptoms. Stone believes that if the trismus progresses rapidly and is complete in twenty-four hours, the prognosis is twice as grave as when the trismus is tardy in appearance or incomplete. Calvin and Goldberg have recently published an excellent paper in which they evaluate the prognosis in tetanus and point out the importance of prophylatic antitoxin administration.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 14, 1930. From the Department of Surgery, University of Minnesota.

The cause of death is exhaustion or cardiac failure from long continued or severe clonic convulsions or respiratory failure due to spasm of the glottis or diaphragm.

ROUTE OF TOXIN

The method of transit of the toxin from a local wound to the cells of the spinal cord is by way of the motor nerves. Meyer and Ransom (1903) have shown that the toxin is picked up by the end plates in the muscle, and travels by way of the axis cylinders. Aschoff and Robertson believe that the toxin travels by way of the perineural lymph spaces. In either event, the toxin is not picked up by the cells of the central nervous system from the blood, and it is generally accepted that after the toxin has combined with nerve cells, the antitoxin is not capable of neutralizing it, a fact which demands the earliest possible administration.

TREATMENT:

The treatment of tetanus resolves itself into

1. Neutralization of the toxins present.
2. Relaxation of muscles—prevention of tetanic spasms.
3. Prevention of further absorption of toxins by removal of its source as much as possible.

1. *Antitoxin.*—The first thought should be antitoxin administration. Its merit has been unquestionably demonstrated. Irons collected 252 cases with a total mortality of 71 per cent. There were 142 treated without antitoxin, with a mortality of 77 per cent. In those treated with antitoxin, the mortality was 63 per cent. If the cases given antitoxin are divided into those who received small doses and those who received large doses, the mortality was 70.47 per cent in the former, and 51 per cent in the latter. Mathier reported 960 cases with antitoxin treatment, with a mortality of 38.8 per cent. He also reported 40 cases without antitoxin treatment, with a mortality of 80 per cent. Permien reported 330 cases with antitoxin treatment, with a mortality of 57.7 per cent, and in those cases without this treatment the mortality was 78.9 per cent. The reasons for failures in the use of antitoxin are: (1) late administration; and (2) inadequate dosage.

The route of administration has been the subject of much controversy. Wainwright cites some impressive statistics to show that the mortality is increased by intraspinal therapy. Freedlander, Dean, and others advocate intravenous therapy in preference to intraspinal. On the contrary, Astley Cooper Ashhurst, using the same arguments, strongly urges intraspinal administration of serum. In Bruce's comprehensive analysis of 1,458 British cases, it is seen that no conclusions can be drawn from one method of therapy, for there is such a variance of mortality rates. It is felt that all routes of administration should be used—subcutaneous, intramuscular, intravenous and intraspinal, the most important of which is the intravenous route.

The initial injection of antitoxin should be preceded by 0.5 c.c. subcutaneous. If a painful, urticarial wheal results, desensitization may be carried out as follows: a 1-10 dilution is made by taking 1/10 c.c. of the antitetanic serum and diluting with salt solution to 1 c.c. Subcutaneous injections are made every 15 minutes.

First injection—¼ c.c. of 1-10 dilution.
Second injection—½ c.c. of 1-10 dilution.
Third injection—0.1 c.c. of undiluted serum.
Fourth injection—0.5 c.c. of undiluted serum.
Fifth injection—1.0 c.c. of undiluted serum.

In half or three-quarters of an hour, the remainder of the antitoxin may be given.

At least 100,000 units of antitoxin should be given an adult within the first twenty-four hours. The dosage may be divided as follows: 60,000 units intravenously in three doses, 20,000 intramuscularly and 20,000 intraspinally. The intraspinal administration has one qualification. Everyone who has treated tetanus knows the importance of minimizing external stimuli, and how peripheral irritation may precipitate increased muscular spasms. It is possible that in our anxiety to give the antitoxin intraspinally, this fact is forgotten. The patient should be well protected with sedatives and soporifics to eliminate as far as possible the stimuli which accompany the changing of posture, the preparation and the introduction of the needle in making the spinal puncture. If the patient is not so fortified, the spinal administration should not be attempted. In view of the evidence which casts doubt upon the efficacy of intraspinal administration of antitoxin this method of treatment is not urged. On the second and third days, the total dosage should be at least 75,000 units each day, the majority preferably given intravenously. The administration of antitoxin should be continued for seven days, employing decreasing doses and increasing intramuscular proportions. Because absorption is slowest from the subcutaneous tissues, the dosage in the last few days should be given by that route.

The total dose should be not less than 300,000 to 350,000 units. Freedlander gave a total of 755,000 units to one patient, practically all intravenously. The danger of anaphylaxis has been overestimated. In England alone, during the World War, some two millions of prophylactic doses of antitetanic serum were given, out of which huge number only eleven cases of shock were reported.

In the event of the appearance of an anaphylactic reaction, 1 c.c. of adrenalin or ephedrin may be given. It has been demonstrated that ether anethesia protects against anaphylactic reactions. If there is a wound necessitating operative interference and ether is used, the antitoxin should be given at this time.

2. *Symptomatic.*—The protection of the patient from external stimuli needs more consideration. When a patient with tetanus is first seen, all routine procedures which are time-consuming and which expose the patient to needless irritation should be omitted. He should receive his first antitetanic serum and be immediately transferred to a single, quiet, darkened room. Chloral hydrate is the most useful of the hypnotics, and is best given by rectum, either with olive oil, which retards absorption somewhat and prolongs its action, or with tap water. Rectal administration of sedatives and anesthetic agents is preferable to the oral route, because of the trismus, and especially for chloral, because of its somewhat unpleasant taste, gastric irritation, and because it is absorbed best from the rectum. The dose is 30-45 gr. repeated every four hours as necessary. Rectal ether has been used, but repeated doses lead to considerable irritation. German authors have reported favorable results with avertin (tribromethylalcohol), which is non-irritating and does not usually produce the excitement often seen with ether. The dose is 80 mg. per kilogram of body weight.

Novocain injection of the muscles of mastication for the relief of trismus, the injection of the phrenics to alleviate or obviate diaphragmatic spasm and similar procedures may have a place in selected instances.

The use of magnesium sulphate is heroic treatment and should be reserved for those cases in which there are severe and prolonged convulsions. Its temporary effectiveness weighed against the dangers of respiratory paralysis should be carefully considered before it is used. In critical cases, it is most efficaciously given intravenously. A 3 per cent solution is injected at the rate of 5 or 6 c.c. a minute, carefully watching the respiration. If any symptoms of respiratory failure should manifest themselves, 2.5 per cent calcium chloride is immediately given intravenously until such symptoms have subsided. The calcium chloride should always be in a syringe ready for use before the injection of magnesium sulphate is started.*

3. *Wound.*—Treatment of the local wound should be effective and have as its basis the removal of all devitalized tissue and foreign bodies, followed by irrigation or application of antiseptic and oxidizing agents, preferably Dakin's solution. Antitetanic serum is injected proximal and near to the wound.

CHRONIC AND LOCAL TETANUS

Other forms of tetanus occur, but are not accompanied by the high mortality and urgency of treatment as tetanus following within ten or fifteen days of the receipt of a wound. In those who have been given antitoxin as a preventive, there may be anomalous forms. Local tetanus may be limited to groups of muscles or to an extremity. Treatment consists of attention to the wound in the proper manner, and the administration of antitetanic serum. Chronic tetanus and idiopathic tetanus may follow trivial and overlooked wounds. The symptoms appear late, even months after the injury. The patient is often afebrile, with spasmodic contractions of limited groups of muscles, rarely generalized; the characteristic convulsions do not occur. The prognosis is good.

The following case in a child illustrates the treatment of tetanus with a short incubation period.

---

*The intraspinal administration of magnesium sulphate is mentioned only to be deprecated. There is no adequate means of combating respiratory failure, for calcium chloride is of no avail. Its use subcutaneously and intramuscularly is of no value for acute symptoms, but may be an aid in depressing motor activity.

Subcutaneously 1.5 c.c. of a 25 per cent solution per kilogram of body weight may be given three or four times daily. Intramuscularly 0.6 c.c. of the same solution per kilogram may be given five or six times daily.

CASE REPORT

C. L. O., a girl of eight years, had been injured on the posterior aspect of the thighs by a manure spreader, five days prior to admission. The wound had been cleansed with lysol and iodine after the injury, but no tetanus antitoxin was given. The symptoms made their appearance about eight hours prior to admission, the initial symptoms being pain and difficulty in opening the jaws. On admission, the child had a temperature of 100.2°, pulse 105. There was trismus III, opisthotonos I, neck rigidity I, spasticity of the right lower extremity IV. On the posterior upper third of the right thigh, there was a lacerated wound about 4 cm. in length and a similar smaller wound on the left thigh. Both were draining a seropurulent exudate. The history was inquired into with regard to asthma, hay fever, or previous serum injections. In spite of this being negative, 1 c.c. of tetanus antitoxin was given subcutaneously and after twenty minutes of observation, 10,000 units of tetanus antitoxin was given intravenously and 10,000 intramuscularly. The child was taken to the operating room and, under ethylene anesthesia, the wounds were opened widely, all discoverable necrotic tissue removed and Dakin's tubes inserted. Antitoxin (2,500 units) was injected about each wound, thus making a total of 25,000 units of antitoxin on the evening of admission.

Upon being returned to her room, the patient was given 30 gr. of chloral hydrate by rectal route, which was effective in combating the extreme restlessness and diminishing the clonic spasms of the right lower extremity.

Tetanus antitoxin was given for the following ten days by the intravenous and intramuscular route in doses of 10,000 units and subsequently by the intramuscular and subcutaneous route only. The total dosage was 115,000 units, given over a period of ten days. The child continued to be irritable and restless, but took fluid well by mouth except during the first two days, when the fluid intake was maintained by hypodermoclysis of 5 per cent glucose solution. Choral hydrate was continued for thirteen days in 30 gr. doses, making a total of 1,110 gr. or 71.6 gm. Luminal was also used to increase the intervals of chloral administration. The fluid intake averaged 1,500 c.c. and the caloric intake averaged 1,400 calories each day. At the end of the twelfth day all the symptoms had disappeared except the restlessness, irritability and spasticity of the right lower extremity. The wounds on the thighs which had been irrigated with Dakin's solution, followed Dakin's packs and finally dry dressings, were now practically healed. The child was up in a chair on the fourteenth day and was discharged on the thirtieth day with no complaint.*

GAS GANGRENE

Unlike tetanus, which was recognized in ancient times, the first case of gas gangrene was described in 1853, but it was not until the late war that our knowledge of its course and treatment was anything but fragmentary. Interest in the subject was stimulated by five cases occurring at the University Hospital in the past year and a half.

Gas gangrene may be defined as a spreading, moist gangrene produced by gas-forming anaërobic bacteria in extensively traumatized tissues. It is characterized by a gaseous infiltration and edema of the part affected, and by change in the color and contractibility of the muscle. Its pathology is essentially that of devitalized muscle. The causative organisms may rightfully be confused in our minds, for they have been given many synonymous appellations. In an attempt to clarify these, and assign a standard nomenclature, the following table is given:

ETIOLOGY

1. Clostridium Welchii—80-90%.
    - B. Welchii—Welch & Nuttal, 1892.
    - B. Aerogenes capsulatus—Fraenkel, 1893.
    - B. Perfringens—Veillon & Zuber, 1898.
    - B. Phlegmonis emphysematosæ—Frankel.
2. Clostridium edematis maligni (Septique)—10-15%.
    - Vibrion septique—Pasteur, 1876.
    - B. Edematis maligni—Koch & Gaffky, 1881.
    - B. of Ghons & Sachs—I.
3. Clostridium Novyi—5-6%.
    - B. Edematiens—Weinberg & Sequin, 1915.
    - B. Bellanosis—Weinberg & Sequin.
    - B. Edematis maligni II—Novy, 1894.
4. Clostridium histolyticum.
    - B. Histolyticus—Weinberg & Sequin.

One or more of the above organisms are usually associated with *Bacillus sporogenes*, *Bacillus proteus* and various streptococci or staphylococci. *Bacillus sporogenes* associated with *Clostridium welchii* enhances its virulence four to five times, as do certain streptococci. *Clostridium welchii* and *Clostridium novyi* mutually stimulate activity.

The average incubation is three to five days.

COURSE

We may picture the progress of a typical case somewhat as follows: Given a wound with intensive muscle damage at a distance from the surface, and the introduction of one or more of the pathogenic gas-producing anaërobes, usually with other organisms. The histological picture of the disintegrated muscle and the tract of an offending instrument closely resembles a freshly made beef emulsion, and makes an ideal culture medium for this group of bacteria. The lack of definite lymphatics within a mass of skeletal muscle makes the whole muscle bundle a lymph space, and with the trauma this is broken, thus constituting the first break in the circulation. With the edema resulting from the injury and the toxins produced by the growth of the organisms, there is further muscle destruction and hemolysis of the blood clot, thus constituting a vicious cycle. Gas is now formed and forces itself up and down the muscle bundle, opening up new paths for the toxin and disseminating bacteria. The organisms have appeared halfway up the anterior abdominal wall in three and a half hours after injection into the thigh of a rabbit. That the gas has sufficient force to do this may well be visualized when we consider the experiment of Taylor. He connected an autoclave gauge by means of a rubber tube, to a culture tube of dextrose broth inoculated with *Clostridium Welchii.* Within two hours, the pressure began to rise and in six hours it had reached a pressure of twenty-three pounds and blew off the tube. I have obtained pressures of 30 pounds in twenty-four hours incubation.

---

*Prof. F. DeQuervain, who has had very large experience with tetanus, has never seen an adult with established tetanus recover, in whom the incubation period was less than 8 days; recovery following tetanus in children with incubation periods of such lengths however does occur.[27]

The pressure increases, the lymphatics are occluded, producing more edema, finally leading to venous obstruction. At this point, the muscle degenerates from lack of nutrition, and with the circulation so impaired, a fresh supply of leukoytes is denied the site, and the infection progresses rapidly. The mechanics of this entire vicious cycle is so pyramided that an infection may be well advanced in two hours and death from massive gangrene of an entire limb can occur in less than thirty hours.

DIAGNOSIS

The history is of importance only in that it may strengthen the suspicion that certain types of wounds may be contaminated by gas bacilli. As in tetanus, any wound contaminated by bits of clothing and dirt makes gas gangrene a potentiality.

Pain is an early symptom and is out of proportion to the severity of the injury. Many patients will complain of their dressings being too tight and ask to have them loosened. Upon removing the dressing, the characteristic odor, the gun-metal, bluish discoloration, the reddish brown discharge, blebs of the skin and gas in the tissues make the diagnosis certain. The gas may be palpated as crepitation; may be heard as fine crackling, explosive sounds with a stethoscope, or may be seen by *x*-ray examination in the soft tissues.

INCIDENCE

The incidence in the U. S. Army during the World War was as follows: Of 128,265 wounds of the soft parts, 1,389 or 1.08 per cent were complicated by gas gangrene, and of 25,272 wounds complicated by bone fractures, 1,329 or 6.26 per cent developed gas gangrene. The extremities were involved in over 80 per cent; nearly one-third of the cases were of the leg.

MORTALITY

In 5,449 cases collected from the literature, the average mortality is 38.5 per cent. The death rate varies from 15 to 60 per cent, as given by different authors.

PROGNOSIS

The relation between incubation period and prognosis, although not as definite as in tetanus, has some significance. In general, the longer the interval between the probable inoculation of organisms and the onset of symptoms, the less virulent will be the infection. There is no method of predetermining when an infection is going to be of a fulminating or a localized type. The two factors which ultimately determine prognosis and mortality are the virulence of the infection and the resistance of the individual, for neither of which we have an adequate measure.

The cause of death in gas gangrene is usually the overwhelming toxemia as a combined result of the toxins produced by the anaërobes and protrolytic destruction of tissue. Sudden deaths have been attributed to embolism from the gas.

TREATMENT

As a basis for treatment, we may divide the cases into two groups for convenience of description: (1) virulent or massive gas gangrenes; (2) avirulent or localized.

PROPHYLACTIC

Prophylactically, the possibilities of the development of gas gangrene must be kept in mind. A thorough debridement should be done on any wound with such potentialities and prophylactic polyanaërobic antitoxin should be given intramuscularly in doses of 20-30 c.c.*

---

*This serum may be obtained from several of the biological and pharmaceutical supply companies (Lederle, Mulford, Cutter). The cost averages about $10.00 for 100 c.c. In one serum, the proportions are tetanus antitoxin, 100 u., and antitoxin for the toxin produced by *Clostridium Welchii,* 15 u., *Clostridium edematis maligni,* 300 u. (*Vibrion septique*) and *Clostridium histolyticum,* 200 u. in each c.c. of serum. The antitoxin for *Clostridium welchii* alone (Perfringens antitoxin—Mulford) is somewhat less in cost, due to its use in intestinal obstruction, a use which is apparently unwarranted. (The average cost for tetanus antitoxin is $1.50 for 1,500 u. for prophylactic use, and $6.00 for 10,000 units for therapeutic use.)

THERAPEUTIC

In virulent gas gangrene, when an entire extremity is involved, amputation by the transfixion method should be performed. No tourniquet should be used. If of a lower extremity, the anesthesia of choice is spinal.

All muscles should be carefully inspected, and any that present brownish discoloration, do not contract when pinched, or do not bleed freely, should be excised until healthy muscle is encountered. The wound is left open and dressed lightly.

Transfusion of whole blood may be a life-saving measure in combating shock following debridement or amputation. Its value is further enhanced by the fact that there is often an acute secondary anemia produced by the hemolytic toxin elaborated by *Clostridium welchii.*

Secondary suture may be done after three to four days, depending upon the local condition. Of the various antiseptic and oxidizing agents that have been advocated, Dakin's solution is the one of choice.

In localized or avirulent gangrene, complete excision of the affected muscle may suffice, taking advantage of the fact that the infection progresses in the direction of the muscle bundle and is limited by the fascial compartments. Drummonds and Neligan, Ivens, and Kellogg Speed have reported good results in this type of case. The criteria for resection are color, contractibility and bleeding.

The status of .polyvalent anti-gas gangrene sera has been somewhat confused by the varying reports from the late war. The French developed a potent antitoxin and were enthusiastic; the British and Americans were rather late in adopting it, and their experience was not extensive enough to warrant adequate conclusions; the German antisera was of very low antitoxin titre, which accounts for their poor results. The following shows that potent antitoxin is worthy of use:

Sacquepee gave antitoxin to 319 wounded men with a resulting incidence of gas gangrene of 1.17 per cent. In a control series the incidence was 7.2 per cent. In a series of 191 developed cases, the mortality in those treated with polyanaërobic antitoxin was 13.9 per cent, while in the same region the untreated cases showed a mortality of 75 per cent. Ivens gave a polyanaërobic antitoxin to 433 cases in which there were 30 cases of gas gangrene when first seen. In this series there was one death.

Numerous American authors have recently encouraged its use (Kling, Morris, Gage, Baldwin and Gilman, Larson and Pulford and others). Experimentally, the antitoxin that is available today is efficient in neutralizing the toxins produced by the pathogenic anaërobes (Kling). The dose should be on an average of 100 c.c. for two or three days, given intravenously and intramuscularly near the wound.

CASE REPORT—GAS GANGRENE

P. M., aged 30, was admitted December 12, 1929. At 9:30 on the morning of December 9, the patient sustained a shotgun wound to the right leg and thigh. On the evening of December 10, about thirty-six hours after the onset of the injury, bluish discoloration of the foot and ankle was noted by the attending physician. Fifteen hundred units of tetanus antitoxin were administered. During the following day, the gangrenous process extended to the knee.

At the time of admission, at 1:00 a. m. on December 12, the entire right leg was gangrenous. The thigh was very edematous, the skin of the lower third was of a gun-metal color with many blebs and the characteristic odor of gas gangrene. Crepitation was palpable on the medial aspect of the thigh, extending up to the perineum. The temperature was 102°, pulse 130; the patient was disoriented and acutely ill. The blood pressure was 108/70. The hemoglobin was 67 per cent; R. B. C. 3,030,000, W. B. C. 17,450, of which 92 per cent were P.M.N.s.

Forty c.c. of perfringens antitoxin were given intravenously and the patient was taken to the operating room within an hour after admission. He experienced a rather severe chill following the intravenous antitoxin and the operation was delayed about thirty minutes. Under spinal anesthesia, the right thigh was amputated as high as possible. Although the incision was made just below the inguinal ligament, gas was encountered and the muscles on the medial side were dark in color and non-contractile. Debridement was done, necessitating excision up to the inferior spine of the pubic bone. One hundred fifty c.c. of perifringens antitoxin was injected into the stump, which was left open and a light dressing applied.

The patient continued to be critically ill, was irrational and very agitated, the temperature varying from 101 to 104 degrees. On the following morning, 45 c.c. of perifringens antitoxin was given intramuscularly, and the patient transfused with 500 c.c. of whole blood by the semi-direct paraffin-tube method. Dakin's packs were applied to the amputation stump. On the third day, 40 c.c. of perifringens antitoxin was again given intramuscularly. No further evidence of gas gangrene was seen, and after a very stormy time for about a week, rapid improvement was apparent.

Skin traction was applied to the stump and Dakin's packs continued. On January 10, after subcutaneous desensitization, 25 c.c. of perifringens antitoxin was injected into the muscles of the stump and under spinal anesthesia the remaining portion of the femur was disarticulated, the skin undermined for a distance, and traction again applied. Subsequent implantation grafts were done on the stump, and at the time of discharge epithelialization was practically complete.

The reason for giving the antitoxin prior to the second operation was because of the well known ability of spores of *Clostridium welchii* to be dormant in tissues, especially when sequestra are present. With further trauma or any procedure diminishing the resistance of the part, gas gangrene may again result. The same is true of tetanus.

Because of two cases of virulent gas gangrene following amputations in which there were chronic ulcers in the affected extremity, we have been culturing chronic ulcers of all types and find the presence of pathogenic gas-producing anaërobes a not infrequent occurrence. Prophylactic polyanaërobic antitoxin should be given prior to amputation or other operative procedure in such cases.

SUMMARY

Tetanus and gas gangrene have many points of similarity, and should be thought of simultaneously as a potentiality in any wound contaminated by soil, clothing and other foreign material. The diagnostic membrane in diphtheria corresponds to the dirt and foreign body, and as diphtheria antitoxin is given on seeing the membrane, so should antitetanic serum be given when there is dirt in a wound (MacConkey). In especially suspicious cases, polyanaërobic antitoxin should be given. The first thought in treatment of tetanus should be adequate administration of concentrated antitetanic serum. Adequate dosage is large dosage for the first days of the symptoms. The preferable route is intravenously. Elimination of peripheral irritation and external stimuli is best accomplished by rectal administration of sedatives and anesthetic agents. Further absorption of toxin is prevented by debridement of the wound and institution of antiseptic and oxidizing agents, preferably Dakin's.

Gas gangrene is the result of a multiplicity of bacteriological and tissue factors and the progress of the infection is a result of the operation of several vicious cycles.

The basis of treatment in gas gangrene is the breaking of the vicious cycles, accomplished by (1) the elimination of the entire part involved or excision if localized; (2) wide exposure, thus eliminating as much as possible anaërobic conditions; and (3) administration of antitoxin. Transfusion of whole blood may be a determining factor in recovery. The presence of gas-producing, pathogenic anaërobes in chronic ulcers makes gas gangrene a possible complication of any surgical procedure directed to their removal, and the surgeon must be prepared to prevent or treat this complication.

BIBLIOGRAPHY

1. Ashhurst, Astley Cooper: Report on tetanus. Arch. Surg., 1:407, 1920.
2. Armstrong, Charles: Tetanus following vaccination against smallpox and its prevention. Public Health Reports. 42:3061, 1927.
3. Bruce, David: Tetanus analysis of 1,458 cases. Jour. Hygiene, 19:1, 1920.
4. Bull and Pritchett: Toxin and antitoxin of and protective inoculation against B. Welchii. Jour. Exp. Med., 26:119, 1917.
5. Baldwin and Gilmour: A study of gas gangrene in civil surgery. Ann. Surg., 85:161, 1927.
6. Calvin, J., and Goldberg: The prognosis of tetanus. Jour. Am. Med. Assn., 94:1977-1981, 1930.
7. Cramp, Walter: Gas bacillus infection with special reference to treatment. Ann. Surg., 56:544, 1912.
8. Dayton, Neil: Anaërobic infection, Boston Med. and Surg. Jour., 194:1032, 1926.
9. Dickinson and Traver: Gas gangrene in civil surgery: the value of serum treatment. N. Y. State Jour. Med., 28, 1928.
10. Freedlander, Samuel: The treatment of tetanus. Ann. Surg., 85:405, 1927.
11. Gage, F. M.: Gas bacillus infection—a frequently unnoticed source in civil life. Am. Jour. Surg., 1:177, 1926.
12. Goedecke, R.: Treatment of tetanus with intracranial subdural injections of antitoxin. Zentralbl. f. Chir., 55:1027, 1928.
13. Gross, G.: Gangrene gazeuse—documents statistiques. Bull. Acad. de med. Paris, 76:586, 1916.
14. Heilbroun, S.: Prophylaxis against tetanus. Munchen. med. Wchnschr., 74:2058, 1927.
15. Ivens, M. N. F.: Clinical study of anaërobic wound infection. An analysis of 107 cases of gas gangrene. Med. Press and Circ., 103:12, 1917.
16. Kling, David: Treatment of gas gangrene with normal horse serum. Ann. Surg., 91:261, 1930.
17. MacConkey, Alfred: Tetanus. Brit. Med. Jour., 2:609, 1914.
18. McNee & Dunn: Method of spread of gas gangrene into living muscle. Brit. Jour. Surg., 1:727, 1917.
19. Meltzer: Inhibitory properties of magnesium sulphate and therapeutic application in tetanus. Jour. Am. Med. Assn., 66:931, 1916.
20. Morris, Joseph: Prophylaxis of gas gangrene in civil surgery. Ann. Surg., 87:772, 1928.
21. Sacquepee, E.: French research on gas gangrene. Lancet, 2:605, 1920.
22. Spanyi, Geza: Treatment of tetanus by subdermal reinjection of cerebrospinal fluid. Schweiz. med. Wchnschr., 57:1047, 1927.
23. Speed, Kellogg: Localized gas infection treated in

war wounds by muscle group excision. Jour. Am. Med. Assn., 70:225, 1918.

24. Taylor, Kenneth: Factors responsible for gas gangrene. Lancet, 190:123, 1916.
25. Taylor, Kenneth: Observations on the pathology and bacteriology of gas gangrene. Jour. Path. and Bact., 20:384, 1916.
26. Wainwright, Jonathan: Tetanus: Its incidence and treatment. Arch. Surg., 12:1062, 1926.
27. Wangensteen, O. H.: Personal communication.
28. Wiedkopf, Oskar: The scientific foundation and prospects of treatment of tetanus with local anesthesia. Brun's Beitrage zur klin. Chir., 137:187, 1926.

HEALTH CONDITIONS IN THE UNITED STATES

In a report recently made public by the United States Public Health Service, Surgeon General H. S. Cumming points out that for the past fiscal year health conditions throughout the United States were generally good, with the exception of certain diseases. The prevalence of influenza and pneumonia was comparatively low during the year, and there were comparatively few deaths from these conditions.

Yellow fever did not appear in the United States or its possessions during the year. Gratifying progress has been made in the control of this disease, which has not appeared in epidemic form in the United States since 1905, but the presence of yellow fever in Brazil and Colombia in South America during the year showed that its introduction into the United States is possible, and the mosquito which spreads the disease is known to abound in certain areas in this country.

Plague-infected rodents were found in the State of California, but no human cases were found in the United States or its possessions. Cases are likely to occur, however, as long as the infection exists in rodents. Plague was reported in many of the ports with which the United States has commerce. It was present during the year in all the grand divisions of the world, with the exception of Australia.

Preliminary figures show a decrease in both the birth and death rate as compared with the preceding year. This is a continuation of the trend which has been noted in the statistics for most civilized countries for several decades.

In 1928 there was an increase in the incidence of malaria. This disease has been disappearing from many parts of the United States where it was once prevalent. For 1929 the reports from 45 states showed a slight decrease in malaria deaths from the high figures of 1928, but in some of the southern states where malaria is a serious problem, the reports of cases and deaths show increased prevalence in 1929 as compared with 1928.

The case and death rates for diphtheria have been decreasing for many years, and in the calendar year 1929 these rates reached new low records. Forty-five states reported 71.4 cases of diphtheria and 6.6 deaths per 100,000 population. Ten years ago, in 1919, 37 states reported 137 cases of diphtheria per 100,000 population, and the diphtheria death rate in 32 states was 13 per 100,000. These were low rates at that time, but the 1929 rates are nearly 50 per cent lower. There is no doubt that the use of antitoxin and immunization against diphtheria has contributed to the remarkable decline in the number of diphtheria cases and deaths. If these agencies had been more generally used, the improvement would have been greater.

The incidence of meningococcus meningitis has steadily increased since 1924 to the winter of 1930. But in the spring of 1930, the number of cases dropped below the figures for 1929.

The prevalence of pellagra has been increasing for several years. In 1924 the pellagra death rate computed from reports to the Public Health Service was 2.5 per 100,000 population. The rate rose steadily until 1928, when it was 5.7 per 100,000 (based on reports from 45 states). For the calendar year 1929 the pellagra death rate was 5.5 per 100,000 population.

During the calendar year 1929, the incidence of infantile paralysis was lower than it had been since 1926, but by the end of June, 1930, there was a marked increase in the number of cases reported. Reports of unusual prevalence of this condition were received from communities in widely separated parts of the United States. This disease normally reaches its greatest incidence in this country in the late summer and early fall.

For three years, at least, the incidence of smallpox in the United States has been increasing. Forty-five states reported 34,685 cases of smallpox in 1927, 38,114 cases in 1928 and 41,458 cases in 1929. The disease was of the mild type and in the 45 states only 442 deaths were recorded during the three years; yet, the 114,000 cases of smallpox represent an incalculable amount of suffering and a large economic loss to the country, all of which could have been avoided by vaccination and revaccination. One danger in smallpox lies in the fact that the virulent type of the disease may appear at any time in a community not protected by vaccination, and before the disease can be checked it may take many lives.

Low records were also reported during the year 1929 for tuberculosis and typhoid fever.

Nine hundred seventy-five cases of undulant (Malta) fever were reported to the Public Health Service for the calendar year 1929, with 41 deaths. The importance of undulant fever becomes more apparent as more is learned of the disease.

Tularemia is much more widespread than it was thought to be when the disease was discovered. The reports are not complete, but in 1929, 461 cases and 36 deaths were reported to the Public Health Service.

The mild type of typhus fever, which differs in some respects from the Old World typhus and from the form of typhus which is endemic in Mexico, was reported during the year 1929 in a number of states, especially in the southeastern part of the United States. Incomplete reports showed 239 cases of typhus fever and 16 deaths from this disease in 18 states during 1929. —*Health News*, U. S. Public Health Service, January 4, 1931.

ACUTE TRAUMATIC SURGERY OF THE ABDOMEN*

Karl Meyer, M.D.
Chicago

With the ever increasing number of automobile accidents the early diagnosis and adequate treatment of non-penetrating injury to the abdomen is assuming greater importance. It is important to determine whether an individual who has received a blow to his abdomen is suffering from a simple contusion requiring conservative treatment, or whether he has a severe intra-abdominal injury demanding operative intervention. Exploration of every case is unwarranted, because an unnecessary operation may deprive the individual of his chance of life. Operative interference is most effective when instituted before the symptoms of visceral injury are immutably present.

I have recently reviewed the records of ninety-four non-penetrating injuries treated on our service at the Cook County Hospital in which the diagnosis was confirmed by operation or autopsy. In kidney injuries the presence of hematuria was accepted as evidence of injury to the kidney or bladder.

This series shows evidence of kidney injury in thirty-three cases, liver in twenty-three, spleen in fourteen, bladder in fourteen, intestine in ten, gall-bladder in two, mesentery in one, and epigastric vessels in two.

Evidence of kidney injury was present more frequently than that of any other organ. The high incidence of kidney injury is explained by the fact that the presence of hematuria, which occurs in about 95 per cent of cases of trauma to the kidney, enables us to diagnose slight degrees of kidney injury that would otherwise go on to spontaneous repair unnoticed.

The most common cause of injury was direct violence over the kidney area. Indirect violence such as a fall on a portion of the body remote from the kidney, and violence from muscular effort, as, for example, in preventing a fall, were less common. Kust, in attempting to explain the mechanism of kidney injury, showed experimentally that the violence causes a sudden increase in the intrarenal hydrostatic pressure with resultant rupture of the tubules. The line of rupture extends radially from the pelvis. The extent of injury may vary from a partial to complete rupture of the kidney parenchyma, avulsion of the pedicle or pelvis, or rupture of the peritoneum overlying the kidney with extravasation of blood and urine into the peritoneal cavity.

In this series the right kidney was injured in nineteen cases and the left in fourteen cases. The right kidney is anatomically more or less fixed by the liver, so that it cannot escape an impact. The left kidney, however, is mobile and may be displaced instead of injured by a blow.

Hematuria is the most common finding associated with injury to the renal parenchyma. Blood is usually present in the first voiding, but it may be delayed from two to three days. Hematuria may be absent in avulsion injuries of the kidney pedicle, pelvis or ureter.

Pain over the renal area is usually moderate and constant, but it may be severe and sometimes simulates renal colic.

Extravasation of blood and urine from renal injury may manifest itself in several ways. There may be a tumor mass in the kidney area, or the swelling may extend into the groin. Spasm of the lumbar muscles may be so intense as to flatten or obliterate the normal contour of the affected side. When the blood or urine gains access to the peritoneal cavity the classical signs and symptoms of peritonitis may develop.

Exclusion of other traumatic causes of hematuria, such as injuries to the bladder or urethra, is necessary before the diagnosis of renal damage is reasonably certain.

The treatment of such injuries should be guided by the intensity of the hematuria or signs of internal hemorrhage. Patients with hematuria following an apparently slight injury should be confined to bed for one week after the microscopic signs of blood in the urine have disappeared. Patients with a moderately severe kidney injury are treated usually conservatively but close watch for increasing hemorrhage or infection must be maintained. When the life of a patient is endangered by a severe initial hemorrhage or one which extends over a period of several days, an exploration of the injured kidney is advisable. Again conservatism should be adhered to and as much kidney parenchyma as possible saved. Tamponage suture and partial nephrectomy may be possible in some cases. However, in avulsion injuries or multiple lacerations of the renal substance total nephrectomy is necessary.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 14, 1930.

Rupture of the urinary bladder occurred in fourteen cases in this series. Rupture of the bladder usually occurs when it is distended; the greater the distention, the greater the vulnerability. An empty bladder, or one containing only a small amount of urine, lies in the true pelvis and receives protection from external violence by its bony walls. Injury to the bladder in this state is usually secondary to fracture of the pelvic bones. The distended bladder projects above the symphysis pubis and is, therefore, exposed to injury from blows to the abdominal wall. This accounts for the greater incidence in chronic alcoholics, prostatics and patients with paralytic bladders.

Rupture of the urinary bladder may be intraperitoneal (12 cases) or extraperitoneal (2 cases). In intraperitoneal rupture the tear is usually present in the posterior median portion of the fundus, whereas in extraperitoneal rupture it is usually anterior.

The symptoms and signs vary according to the site of rupture. Intraperitoneal extravasation results in diffusion of urine throughout the peritoneal cavity and manifests itself as diffuse peritonitis. There may be an urgency but the patient is unable to urinate. Extraperitoneal rupture results in extravasation of urine into the perivesical spaces. A tumor may be palpable in the lower abdomen or pelvis. Later this may become secondarily infected with resultant cellulitis.

Catheterization usually yields only a small amount of bloody urine. When the catheter passes through the tear in the bladder wall large quantities of urine or bloody fluid may return. In one of our patients 7,795 c.c. was obtained in this manner. When this occurs the fluid flows with diminished force and may fluctuate with the respiratory movements.

Other tests include the introduction of a measured amount of water into the bladder, then noting the amount returned. Decrease in the amount returned is evidence of rupture. In small perforations, however, this may not be true. Vaughan and Rudnick in 1924 described a valuable test. During fluoroscopic examination about 400 c.c. of air is injected into the bladder. An intact bladder has a round regular outline. If a rupture is present, no matter how small, air will pass extravesically into the peritoneal cavity or the perivesical tissues. When positive, this test is diagnostic of ruptured bladder. This test was attempted in five cases in this series and was positive in four. In one case the cystogram had a smooth outline and no air was seen to escape into the free peritoneal cavity. At operation a sealed perforation was found in the fundus of the bladder. All cases of ruptured bladder should be operated upon, with repair of the rupture and drainage of the bladder by retention catheter.

Rupture of the spleen occurred in fourteen cases in this series. Subcutaneous rupture of the spleen usually results from direct violence over the splenic area. Indirect violence is uncommon. The damage of the spleen may vary from a subcapsular contusion to partial or complete tears of the splenic parenchyma, or avulsion of the pedicle. Hemorrhage is usually profuse and continuous although it may be stopped temporarily by the formation of a subcapsular hematoma or coagulum. These barriers may later give way and result in a severe secondary hemorrhage. This occurred in one of our cases, an epileptic who was admitted to the neurological service immediately after a convulsion. He was apparently recovering from the effects of his convulsion, when, on the third day following his admission, he suddenly developed symptoms of internal hemorrhage and died. Autopsy revealed a ruptured spleen.

The symptoms of ruptured spleen are those of hemorrhage associated with symptoms of abdominal injury. The initial shock is severe, probably the result of the severe hemorrhage. Pain is usually localized to the left upper quadrant, although some diffuse abdominal pain may be present. Local tenderness and rigidity over the splenic arc are present in the majority of cases. Shifting dullness in the flanks is present with large hemorrhages. The symptoms of secondary or delayed hemorrhage may occur from three to six days after injury.

The treatment of a ruptured spleen is immediate operation. To delay operation is merely to allow the hemorrhage to continue and the patient to become exsanguinated. Blood transfusion is given whenever possible, preferably after the source of bleeding has been removed. It is also of great value pre-operatively in individuals suffering from severe shock and loss of blood. The type of operation depends upon the condition of the patient and the pathology found in the spleen. Tamponage may be used, if the patient is in poor condition. This method carries the danger of secondary hemorrhage and infection. Suture of the spleen may be indicated in small ruptures on the upper surface of the spleen. It is of little value in extensive ruptures, especially if they involve the lower surface of the spleen. Splenectomy is the operation of choice. Removal of the spleen apparently has little effect upon the individual. There may be a slight secondary anemia and a moderate leukocytosis that may last for years. Lee reported a case which showed that the splenic tissue cells that are extravasated with the blood throughout the peritoneal cavity may become implanted on the visceral and parietal peritoneum and develop into nodules, varying in size up to those a half inch in diameter. These nodules undoubtedly take up the function of the spleen and are histologically described as typical splenic tissue.

Rupture of the liver was found in twenty-three cases in this series. Liver injuries were very often complicated by severe injury to other organs or fractures of bones. The liver, by virtue of its position between the ribs and the vertebral column and of its heavy and inelastic parenchyma, is easily ruptured. The violence may be directly over the liver. Indirect violence is less common, although a fall from a height, with the individual landing on his feet, may cause the liver to be torn from its attachments to the diaphragm. The right lobe is injured about six times as frequently as the left, the convex surface twice as often as the concave. The injury may vary from a superficial rupture to complete tears through the entire organ.

The symptoms of ruptured liver in general are those of internal hemorrhage with symptoms of local trauma. Pain and tenderness over the hepatic area may be evident in some cases. Diffuse abdominal pain may likewise be present in some. Pain radiating to the shoulder is not uncommon. Dullness in the right flank may be present, if the hemorrhage is severe.

The treatment of ruptured liver depends upon the amount of hemorrhage that has occurred. The greatest danger of hemorrhage, as shown by Edler, is during the first twenty-four hours following rupture. After this, the hemorrhage generally ceases spontaneously. In the absence of marked rigidity of the abdominal muscles, increasing abdominal pain and the usual symptoms of severe internal hemorrhage, the patient may be treated conservatively. He should be watched for symptoms of secondary hemorrhage or infection. If symptoms of progressive internal hemorrhage appear, there is no choice but to operate. The injury to the liver may be sutured by blunt needles or packed.

Rupture of the liver in one case of this series was associated with rupture of the gallbladder. In one case the gallbladder alone was ruptured.

The symptoms of rupture of the gallbladder or biliary passages are those of a local or diffuse chemical peritonitis. About half of the cases show the development of a cystic swelling in the immediate neighborhood of the liver. Jaundice is uncommon with rupture of the liver, occurring in only 4.75 per cent of the cases. It is, however, very common in injuries to the gallbladder or biliary passages, occurring in about 65 per cent of cases. In the majority of cases jaundice appears within a few days. It may occasionally be delayed for several weeks.

Immediate operation is the treatment of choice. Suture and drainage of the gallbladder or a cholecystectomy may be necessary.

Rupture of the intestines occurred in ten cases. The portions of the intestine most easily ruptured are the upper jejunum and lower ileum. These portions, because of their short mesentery, are more likely to be found in front of the lumbar vertebræ and are most liable to be crushed by blows to the abdominal wall. The duodenojejunal junction may be torn from its attachment to the ligament of Treitz. This, however, is uncommon, occurring in only three cases of a series of 132 cases of ruptured intestine reported by Berry and Guiseppe. The intestines may burst from a blow to the abdominal wall. This must be rare, since it can occur only when the intestines contain an unusually large amount of fluid or gas, or are obstructed. Multiple ruptures of the intestines are not uncommon, and the lesions are usually close together.

The symptoms of rupture of the intestines are variable. The symptoms of shock are frequently absent in the early stages and are often present in abdominal contusions in which the intestine remains uninjured. It is of little value in the early diagnosis of injury to the intestine.

Pain may be continuous and increasing in severity and is a most reliable symptom. It may extend or gradually shift in position. Vomiting is frequent and, if associated with pain, is quite suggestive of a ruptured intestine. Rigidity of the abdominal wall is a very valuable symptom, if it persists for more than a few hours after the accident. Pulse and temperature are not reliable in the early stages, but as peritonitis develops, they tend to rise.

Obliteration of the liver dullness, especially if percussion is made along the right axillary line with the patient lying on his left side, is a very valuable sign. A much more dependable sign is the demonstration of free air in the peritoneal cavity by fluoroscopic examination. Although the presence of free air is pathognomonic of a rupture of an air-containing viscus, its absence does not rule out injury to the intestine.

All cases of abdominal injury in which the symptoms are at first indefinite should be kept under close observation for symptoms of peritonitis. The increase in severity and a shifting of the abdominal pain are of value. The gradual rise in the pulse rate in the absence of the usual symptoms of hemorrhage and a gradual rise in the temperature and leukocyte count are indicative of a spreading peritonitis and demand immediate operation.

Immediate operation is indicated in all early cases of rupture of the intestine. Conservatism may be advised in cases first seen four or five days after the injury. An operation at this time may break up the limiting adhesions that nature has laid down to wall off the perforation, thereby converting a local into a diffuse peritonitis. A later operation for the drainage of an abscess or repair of a fecal fistula is less dangerous.

Some cases of ruptured intestine recover spontaneously, with or without abscess formation. In this series one case was operated upon for an intestinal obstruction six weeks after an injury to the abdomen that was treated conservatively. At operation a walled off perforation was found in the ileum, and there was an intestinal obstruction from the strangulation of a loop of gut that had entered a traumatic vent in the mesentery.

Rupture of the pancreas occurred in three cases of this series. The prevertebral portion of the gland alone may be injured. The rupture may involve only the parenchyma, leaving the duct intact, or it may include the duct with the resultant extravasation of large quantities of pancreatic juice in the lesser, and, at times, the greater peritoneal cavity.

There are no special signs or symptoms of rupture of the pancreas. One must rely upon the steadily increasing severity of the symptoms following upper abdominal injuries. The shock deepens, pain becomes marked and the symptoms of peritonitis are prominent.

Patients with these symptoms are usually subjected to an exploratory laparotomy. During this type of operation it is important not to overlook the pancreas, which may be adequately explored through the gastro-hepatic omentum. Care must be taken not to soil the peritoneal cavity with pancreatic juice. The bleeding may be carefully arrested by ligature en masse, or, preferably, by suture. If the tail of the gland is badly crushed, a resection of this portion may be performed. Drainage may be established through the anterior wound or through a special posterior wound. If the duct has been injured there may be a copious drainage of pancreatic secretions. In one case of this series a fistula formed from which pure pancreatic juice was obtained.

There are milder degrees of pancreatic injury not demanding immediate operation. These may give rise to large pancreatic cysts. One case of this series developed a large pancreatic cyst two weeks after a blow to the upper abdomen.

The mesentery should always be explored during operations for abdominal injuries. Tears of the mesentery may give rise to copious hemorrhages. If these tears are not repaired they may become the site of an internal hernia and, possibly, strangulation of the gut, as in the case cited.

Rupture of the epigastric vessels is not uncommon. A large hematoma may form and this must be differentiated from an intra-abdominal mass. The hemorrhage usually ceases spontaneously and the hematoma absorbs without surgical intervention.

CONCLUSIONS

Non-penetrating injuries of the abdomen may be divided from a surgical standpoint into two groups.

Group 1 includes those patients who suffer severe injury to one or more viscera, along with single or multiple fractures. These patients are in profound shock and usually succumb in a few hours, or, at most, within one to two days. Since the severity and multiplicity of the traumata precludes the possibility of operative intervention, these cases are of no great surgical interest.

Group 2 includes those cases with less extensive injury, such as rupture of one organ, generally unaccompanied by a serious fracture. It is this second group which commands the diagnostic skill and surgical judgment of the attending surgeon, for here it is necessary to determine not only the extent of injury, but also the advisability of operative intervention.

The symptoms and signs of subcutaneous abdominal injuries can be divided into general and specific. The general manifestations include primary shock, abdominal pain, tenderness, and, at times, rigidity. (The specific symptoms depend upon the organ involved and permit identification of the structure damaged.) Unless one knows which organ is traumatized the advisability of operation is often in question. For instance, an injury to the left loin might result in a ruptured spleen or kidney. The former should be treated by operation, but the latter, perhaps in most instances, conservatively. All available data and all diagnostic aids, including the *x*-ray, are frequently necessary to determine pre-operatively the type of injury present. No patient should be subjected to operation until a thorough immediate study has been made. The time required for this study is no longer than the time needed to "set up" an operating room, provided the examiner possesses the requisite knowledge. By "requisite knowledge" is meant familiarity with the symptoms and signs characteristic of injury to the individual structures as outlined in the body of the paper.

In spite of the most painstaking investigation there remains a certain percentage of cases in which the site of damage remains obscure. In these cases it is unwise to wait or resort to diagnostic measures which are time-consuming. Laparotomy is the only safe procedure in doubtful cases when the patient is seen early.

COFFEY-HUMBER TREATMENT FOR CANCER

Recent developments in the Coffey-Humber treatment of cancer emphasize the fact that the history of investigations of new methods for the treatment of cancer is marked by the wreckage of dozens of scientific reputations, by the bodies of patients, and by bitter controversy among scientific men. Such conditions establish again the importance of provision within organized medicine for careful study and judgment of new methods before they are given circulation to the medical profession or to the public. Had the proponents of the Coffey-Humber method seen fit from the first to follow established custom in the introduction of their technic and their results, had they consulted the Council on Pharmacy and Chemistry as to the proper method of introducing a new proprietary, they might have avoided all the acrimony, the criticism, and certainly all the notoriety that has been their lot. (Jour. A. M. A,. November 1, 1930, p. 1349.)

THE VREELANDS QUACKERY AGAIN

Recently the Jour. A. M. A. published an article, "The Vreelands Quackery," regarding a fraudulent grow-hair-quick concern run by one Clayt Vreeland of Cleveland, Ohio. In this article it was brought out that among the testimonials used was one from a physician, Dr. C. J. Cannon. Dr. Cannon believes that the reference to his testimonial did him an injustice because it was used without his consent. The fact remains that he gave the testimonial and further that he should have been aware of its use. In 1928 a layman wrote to Dr. Cannon stating that he had read the data received from Vreeland and saw his letter there. The layman asked for the reasons why he considered the preparation good and Dr. Cannon replied that he considered the people honest and reliable and suggested that he call at their office for examination and advice. (Jour. A. M. A., August 23, 1930, p. 613.)

HEPATIC ABSCESS FOLLOWING ACUTE APPENDICITIS WITH RECOVERY*

REPORT OF CASE

Ernest R. Anderson, M.D., and R. C. Webb, M.D.
Minneapolis

ABSCESS of the liver is one of the most dreaded complications of appendicitis. According to Loison,[30] Waller, in 1846, described the earliest case that is recorded in the literature. Other early cases are reported; one by Hillariet[24] in 1849 and one, in 1854, by Buhl,[24] who described a case of multiple abscess of the liver following appendicitis. The cases reported in the early literature were of autopsy findings. The condition was considered as a rare occurrence and invariably fatal. Dieulafoy[8] in 1898 considered that hepatic abscess secondary to appendicitis was always fatal. Deaver[13] in 1921 states that they have never seen a case of liver abscess following appendicitis recover.

When Loison[31] reported to the Societié de Chirurgie de Paris in 1900 a case of hepatic abscess following appendicitis that recovered, Poirier and Tuffier questioned the diagnosis. The earliest case of hepatic abscess, secondary to appendicitis which recovered after surgery, is the one reported by Körte[31] in 1892. In the more recent surgical literature there have been recorded cases of recovery from hepatic abscess following appendicitis.

The following is a case record of a liver abscess complicating acute appendicitis with recovery.

CASE REPORT

R. W., a male, aged 15, was admitted to the Abbott Hospital, Minneapolis, September fourteenth. The patient had always been in good health prior to September 12, 1929, when at 2 a. m. he began to have abdominal cramps which were generalized and persistent, not associated with nausea or vomiting. The following day he went to school. On September 13th he remained at home and took only a liquid diet. The next day he was still ill and was given a cathartic. At 2 p. m. on that same day, September 14th, he began to have pain localized in the lower right quadrant of the abdomen. Dr. E. J. Huenekens saw him at 6 p. m. and made the diagnosis of acute appendicitis with peritonitis. He arrived at the hospital at 7:10 p. m. having a temperature 100.2 degrees, pulse 112 and respiration 22. At 8 p. m. appendectomy was performed. A ruptured gangrenous appendix was removed and an inversion of the appendical stump was done. A generalized peritonitis with turbid fluid in the peritoneal cavity was present. A tubular rubber dam drain was placed into the pelvis and one was passed in the lateral gutter between the ascending colon and the parietal wall. A Gibson[43] rubber dam tampon drain was inserted in the McBurney incision and no closure with sutures was done.

The postoperative period was stormy. On the third day the temperature rose to 103.8 degrees and then gradually receded so that it was between 98.4 and 100.6 degrees until the twelfth postoperative day. From that day on the temperature curve was of the septic type ranging from 98.4 to 104.4 degrees. There were no chills accompanying the elevation of the temperature. The patient had spells of profuse perspiration.

From the first postoperative day there was abdominal distention and some emesis until the seventh day postoperatively. Beginning September 20th the patient complained daily of shooting pains in the lower left chest anteriorly and on September 25th began to have pain in the lower part of the right chest anteriorly. On deep breathing pain was produced. The pain persisted and on October 2nd tenderness developed below the right costal margin. The liver was enlarged and a bulging of the abdominal wall, which was tender, was noted in the right upper abdominal quadrant.

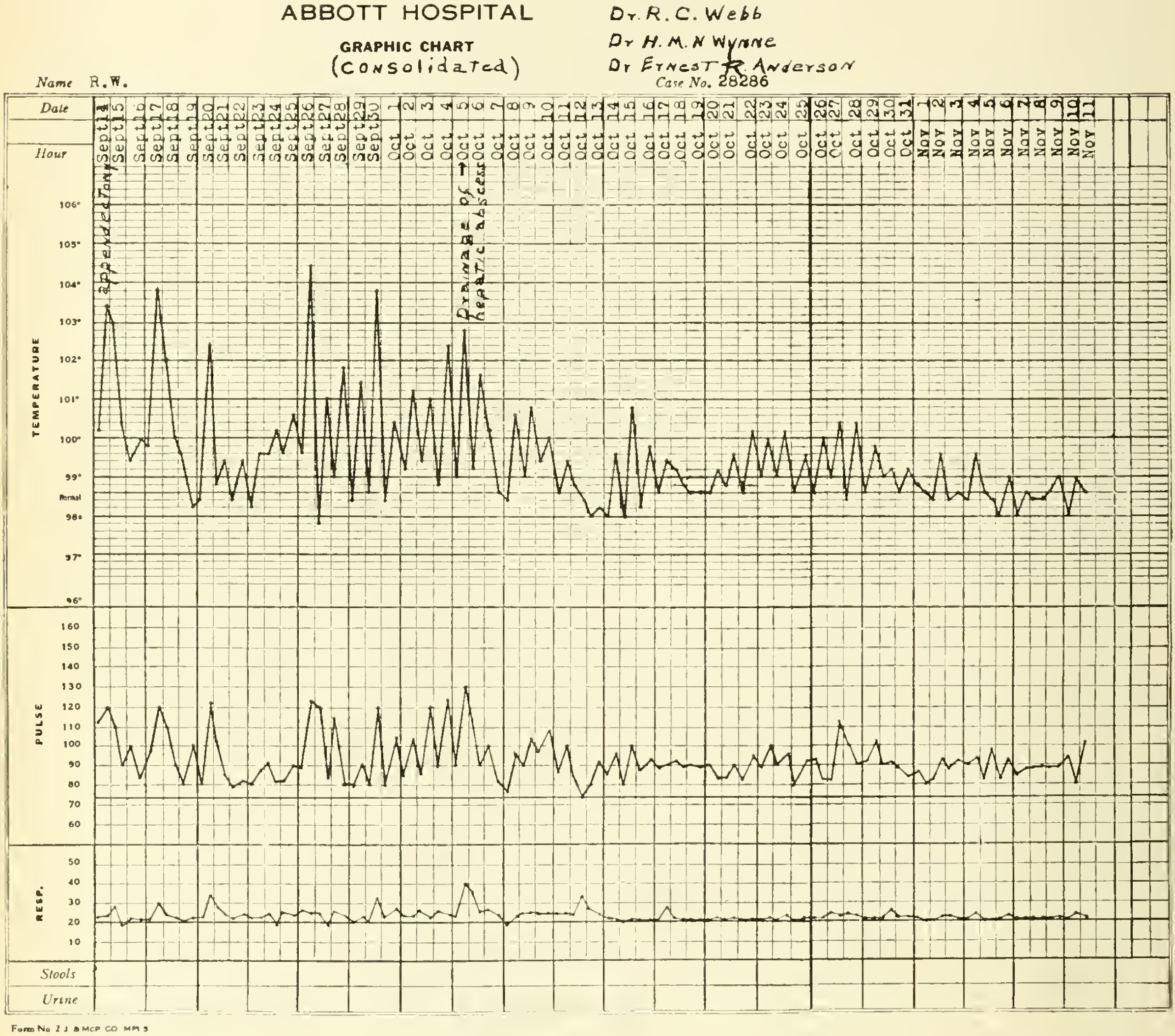
The patient at times presented a picture of being drowsy, listless, and extremely ill; and then again there were intervals when he was alert and bright. There was no jaundice of the sclera or skin present.

Clinical and *x*-ray examinations showed the lungs normal. On September 25th the leukocyte count was 27,000, the differential count: polymorphonuclears 81 per cent, small lymphocytes 14 per cent, large mononuclears 4.5 per cent, and eosinophiles 0.5 per cent. On October 3rd the leukocyte count was 26,000, the differential count being: polymorphonuclears 79.5 per cent, small lymphocytes 15 per cent, large mononuclears 5 per cent, and basophiles 0.5 per cent. The urinalysis on September 25 was: Sp. Gr. 1.012, amber color, clear, alkaline reaction, very faint trace albumin, no sugar, and 1 to 2 pus cells were present. The test for biliary pigments was not performed.

On October 5, under nitrous oxide and oxygen anesthesia, a laparotomy was performed, making an exposure of the liver through an upper right rectus incision. The inferior edge of the liver was fastened to the anterior parietal peritoneum 3.5 inches below the costal margin. The adhesions were not disturbed. On the anterior surface of the right lobe of the liver there was a soft bulging two inches in diameter. The overlying liver tissue was speckled with yellowish pinhead-sized spots.

---

*Read before the Minneapolis Surgical Society, October 2, 1930.



An aspirating needle was inserted and pus obtained from a depth of one inch. The opening into the abscess was made by inserting a clamp along the needle and by spreading the points of the forceps. The abscess cavity was irregular and slightly larger than an English walnut. A gauze pack was placed in the abscess cavity. A direct smear of the aspirated material showed many pus cells. Culturing the same material produced an abundant growth of B. coli.

The temperature gradually became lower and from November 5th it remained normal. The second incision was healed October 19th. The patient was discharged from the hospital November 11th. Since then he has gradually gained in weight and now is a normal boy for his age.

INCIDENCE

The occurrence of hepatic abscess following appendicitis varies but slightly in the recent series that have been reported. Eliason[13] states that in 2,237 cases of acute appendicitis operated at the University of Pennsylvania Hospital three cases of liver abscess developed, making an incidence of 0.13 per cent. In a series of 1,650 cases of appendicitis, Lindquist[29] had four cases (0.24 per cent) of hepatic abscess. He states that Petren found abscess of the liver developing in 0.3-0.4 per cent of the cases of appendicitis. Krogius, as quoted by Babler,[2] observed two cases (0.2 per cent) of liver abscess in 1,000 cases of appendicitis. In 2,714 cases Rendle Short[3] found suppurative phlebitis occurring 0.4 per cent. Two cases (0.11 per cent) of hepatic abscess were observed by Stillman[8] in a series of 1,748 cases of appendicitis.

In the early literature the incidence reported is higher. Gerster[21] in 1,189 cases observed nine (0.7 per cent) of hepatic abscess. Munro[33] estimated the occurrence of hepatic abscess to be 5 to 10 per cent in all cases of appendicitis. In 257 cases Fitz[19] found eleven (4.2 per cent). Five per cent of 546 post mortem examinations of patients dying of appendicitis were found by Armstrong[11] to have had liver abscess and pylephlebitis.

MORTALITY

It has been taught that the mortality in hepatic abscess following appendicitis is very high. This is stated in the text books on the subject and the experience of the early surgeons and pathologists seems to corroborate this fact. In the series which have been reported more recently we obtain encouragement. Petren[29] reports twenty-two cases which were operated upon that ended in recovery. Eliason[16] in 1926 collected from the literature fifty-three cases with a mortality of 59 per cent and to this he added fourteen cases, seven of which resulted in recovery. That reduced the mortality to 54 per cent. Since then, cures have been reported by De Planque,[14] Reök,[38] Barnes and Pearson,[4] George[20] and Lindquist,[29]—one case by each author. During that same time hepatic abscesses following appendicitis, which were operated upon and ended fatally, were recorded by Reök,[38] Martini and Staemmler,[32] Navarro,[35] and Nieweg,[37] each having had one case, and Lindquist[29] three.

Including the case reported in this paper, there are six recoveries in a total of thirteen cases which have been reported in the literature since Eliason's[16] series. The mortality in these thirteen cases is 54 per cent, which is the figure that occurred in the collected cases of Eliason. With the chance of helping about one-half of these hepatic abscesses following appendicitis, surgical intervention is justified. Formerly when no surgical procedure was instituted, these patients died.

MODE OF INFECTION

The routes by which the infection travels to the liver from the appendical region, are readily understood when the anatomy is kept in mind. The most common route is for the infection to be carried along the portal system. From the veins which drain the infected appendical region, bacteria or infected emboli get into the portal circulation, traveling by way of the ileocecal, ileocolic, and superior mesenteric veins into the portal vein and then into the liver. The infected material can travel through these veins without establishing an inflammatory process and be lodged in the liver to be the nidus for the development of an hepatic abscess. This mode of infection is apparently the route the infection traveled in the case herein reported.

With appendicitis there is associated a lymphangitis and lymphadenitis. The regional lymph drainage from the appendix is into the retroperitoneal tissue and toward the diaphragm. The septic material from the appendix can produce a retroperitoneal inflammatory process with abscess formation and from such a focus hepatic abscess can form. Lindquist[29] reports a case where this mode of infection was the possible route.

If a general septicemia follows an appendicitis it is possible for an hepatic abscess to originate from infectious material entering through the hepatic artery. This means that the infection arising from the appendix may have passed through the liver and then entered the general circulation to establish the septicemia. The prognosis in these cases is very grave, as the generalized septicemia is more than the organism can withstand. Several abscesses scattered throughout the body may be produced, the hepatic abscess being only a local manifestation in the liver of what is occurring throughout the system.

Hepatic abscess can be produced by contiguous abscesses that occur following appendicitis. Subhepatic abscess or a subphrenic abscess that has formed from an appendicitis can extend into the liver and involve the parenchyma of that organ. A breaking down of the tissue with the formation of an abscess in the liver results. These cases do not often occur. However, the reverse of this situation happens: an hepatic abscess is formed and found situated near the surface of the liver; it breaks through the capsule, forming an abscess subphrenically or an abscess at whatever point it ruptures.

Infection from an appendicitis which has produced an inflammatory condition of the biliary system, as is manifested in some cases by the occurrence of jaundice, can be the source of the formation of hepatic abscess. The abscesses and inflammatory process have been found to be distributed in the liver along the biliary system. The occurrence of this mode of infection is thought to be rare.

PATHOLOGY

The number of abscesses which have been found occurring in the liver following appendicitis varies. There may be a single abscess or the liver may be riddled with a great number. The condition produced depends upon the amount of infectious material entering the liver. A single embolus may originate from the periappendical region and be carried to the liver to produce a solitary abscess. A single hepatic abscess may occur by the coalescence of several abscesses situated in close relation to one another.

Where there is an abundance of bacteria carried to the liver from the appendical region or from a pylethrombophlebitis several abscesses are formed. A large amount of liver tissue can be destroyed by the formation of multiple abscesses and a severe degree of cholemia be produced. That, with the overwhelming infection, usually proves fatal.

Hepatic abscesses that have occurred have been of different sizes. Some were very small, being only minute spots in the liver; others were larger, approaching the size of amebic abscesses which are seen in the liver. Usually these secondary abscesses do not attain a large size. Some, however, are the size of an orange. The single abscesses are the ones that become the largest.

The distribution of hepatic abscesses is not limited to any certain portion of the liver but may occur in any lobe. The greatest number of abscesses have been found in the right lobe. The abscesses occur in the right lobe five times more often than in the left.[1] Sérège[8] thought that there were two currents of blood in the portal vein. He concluded that the flow from the superior mesenteric vein went to the right lobe and the blood from the inferior mesenteric and splenic veins flowed into the left lobe. He made his conclusions from a study of India ink injections. From the experimental work of Dominici[15] one can not admit that there are two streams of blood in the portal vein.

As there is a greater volume of liver parenchyma in the right lobe and as the branch of the portal vein to the right lobe is of a larger caliber, it would seem that the chance of infectious material getting to the right lobe would be greater than to other portions of the liver. Because of the anatomical relationship it is easier for infectious material, no matter from what vein it originally comes, to enter the right branch of the portal vein.

The abscesses may occur in any part of the liver. The parenchyma can be interspersed with multiple abscesses as seen in cases of appendicitis where there has been a great deal of infectious material carried to the liver. A single hepatic abscess can form deep in the liver parenchmya or near the surface. Many times they are formed on the dome of the liver. Located in this region they may give findings that might be interpreted as a pathologic process occurring in the base of the lung. When the abscess is situated on the anterior surface of the liver there may be signs of an upper abdominal disease, as a ruptured duodenal or gastric ulcer, or gallbladder disease.

Bacteriologic studies have revealed the same organisms in liver abscesses as have been recovered from infected appendices. This list includes practically the entire group of pyogenic bacteria. On culture, bacillus coli was found to be present in the hepatic abscess of the case herein reported. In Eliason's[16] group of cases, eight were cultured. In four, streptococcus; in three, staphylococcus; and in one, bacillus coli were found.

SYMPTOMS AND SIGNS

The symptoms which occur in hepatic abscess are not at all constant. Because of the variance of the symptoms, the diagnosis of hepatic abscess is in many cases not made until the condition has been present for some time. The development of symptoms can be continuous with the onset of the appendicitis, as hepatic abscess has been known to have its origin in the first few hours of appendical disease. Hepatic abscess may in other cases occur several days or months after the primary attack of appendicitis. The appendicitis may be an acute rapidly progressing condition or hepatic abscesses have been known to follow cases where the appendix was only mildly infected and in some cases, as recently reported by Nieweg,[37] the original appendical process was entirely obscured and unrecognized. The recognition of a previously existing appendicitis may in some of the cases be of help in finally determining the existence of an hepatic abscess.

When an hepatic abscess secondary to appendicitis exists, the elevation of the temperature is a constant sign. The septic type of fever is in response to the infectious process. The fever may or may not be associated with chills. Gerster[21] states, "Chills accompanied by a rapid rise of temperature observed during the course of appendicitis, however mild as to the local symptoms, may and usually does signify the entrance of septic material into the portal and general circulation." There may be repeated chills with an increase in the temperature or in other cases only chilly sensations may be present.

Pain is often present but is not a constant symptom. The pain may be located in several places. It may be noticed in the right upper quadrant of the abdomen. Sometimes it is localized below the right costal margin and one may have it occur over the lower ribs of the right side. Some have had pains in the back and others have had referred pains in the right shoulder.

The character of the pain varies; some patients complain of a dull constant aching type of pain; others experience sharp intermittent pain. Where the abscess is located near the diaphragmatic surface, pleuritic type of pain occurs. Abscesses that are placed deep in the liver parenchyma frequently do not produce any pain. The location of the pain may indicate the place where the abscess has developed in the liver.

When carefully looked for, tenderness of the liver is present a greater number of times than the complaint of pain. The elicitation of tenderness in some cases is made by very light pressure over the liver while in others Murphy percussion is required to verify the finding. In the case reported at this time the tenderness was marked; the pressure of the bed covers produced pain in the region over the liver.

In a large number of hepatic abscesses that occur following appendicitis, jaundice is a prominent symptom. The jaundice is intense in some cases and in others very mild, being detected only in the sclera. The occurrence of excessive bile pigment in the circulating blood can not always be detected clinically but the laboratory will show its presence.

The jaundice may appear early in the course of the disease. Soon after the onset of the appendicitis the icterus may appear and it may be thought that an obstructive biliary condition exists. The early appearance of jaundice is an evidence that the liver is being called upon to take care of toxic material coming to it through the portal circulation. In cases of appendicitis that are not complicated by hepatic abscess, jaundice has been known to occur soon after the onset of the disease.

When an abscess in the liver has formed, jaundice may occur. The destruction of the liver parenchyma may be so great that a cholemia results and the icterus becomes an established finding. With an hepatic abscess present there are cases where the jaundice does not occur nor is urobilin found. Eliason[16] states that jaundice is invariably present.

In some cases gastric disturbance may be a prominent symptom. There is a persistent and unrelieved nausea associated with emesis. Liquids or food are not retained and the maintenance of the individual's nutrition becomes a grave concern. Gastric disturbance can be entirely absent. This symptom is inconstant and does not aid materially in arriving at a diagnosis.

With an intraphepatic process an increased volume of the liver is found. The amount of the increase varies. In some cases the enlargement is found only at autopsy while in others the increased size of the liver is easily detected clinically. The enlargement that occurs is uniform and the liver margin can be detected extending below the costal margin. Care should be exercised in determining the height of the superior hepatic margin, as one may interpret the finding of a low lying liver as being an enlarged liver, where the locating of the superior margin would give evidence of a normal liver volume.

In case there exists an abscess on the anterior surface or near the inferior margin, the liver may present clinically an irregularity on its surface. This is rare, as the majority of livers will present a uniform enlargement and the surface will be smooth. The enlargement is due to the swelling of the liver parenchyma in response to the presence of the inflammatory process.

The edema of the tissue overlying the liver was a finding that was noted in the cases observed by Eliason.[16] A thickening of the abdominal wall in the right upper quadrant and on the side of the abdomen which had the characteristics of a lymph edema was noted. The detection of the edema can be made by picking up the tissue of both flanks. By comparison the side involved will be found to be thicker. In the fourteen cases observed by this writer, edema was found in eleven cases. This finding was not present in the case which is being reported.

It has been noted that with hepatic abscess there is a marked degree of general malaise. In the beginning of the illness, the malaise present is usually of such degree as is seen with a far advanced and severe pathological process. The physical findings in these cases are negative or very meager and out of proportion to the weakness which the individual has. The diagnosis will be doubtful until other findings develop as the condition progresses.

The leukocyte count will invariably be elevated in these cases. An increase in the percentage of polymorphonuclear cells occurs. The leukocytosis varies from a slight increase to a count near 30,000. With the drainage of the abscess the leukocytosis diminishes. These findings in the blood are the same as are found in any case of an infectious process.

In the urine, bile and bile pigments may be present. In one series reported, only one-third of the cases had urobilin present in the urine. As a diagnostic aid, the finding of bile pigment in the urine shows a disturbance of liver function and, with the other clinical findings, helps to arrive at the diagnosis of hepatic abscess.

The *x*-ray will in many cases give evidence of hepatic abscess. A raised diaphragm on the right side, which is found on fluoroscopic examination to be stationary, speaks for hepatic disease. A subphrenic collection of pus gives an altered diaphragmatic shadow and, to differentiate it from an abscess in the liver, paracentesis will have to be resorted to in many cases.

Roentgenograms have revealed changes in the base of the right lung and in the right pleural cavity in cases of liver abscess. There has been a thickening of the parenchyma in the base of the right lung and in some cases fluid has collected in the right pleural cavity. These findings have been interpreted as being of pneumonic origin and the hepatic process which existed was obscured. Christopher[9] has recorded a case in which liver abscesses and pylephlebitis secondary to a gangrenous appendix simulated lung abscess. Some of the cases of Eliason's[16] series were diagnosed basal pneumonia.

With the diagnosis of hepatic abscess secondary to appendicitis difficult, on account of the varied symptomatology, one wonders how many of the pneumonias, diagnosed following inflammation of the appendix, are pneumonias. The edema of the tissue around the liver in cases of hepatic abscess can produce lung changes and exudation into the pleural cavity which will give clinical findings simulating pneumonia. In such type of cases the diagnosis may be very difficult and tax the skilled surgeon. The occurrence of basal pneumonia following appendicitis should be regarded as a possible hepatic disease and be determined if necessary by aspiration.

When the aspirating needle is used it should only be for the localization of the abscesses. With pyogenic abscesses the danger of spreading the infection to the pleura or to the peritoneum is great, so preparation should be made, if an abscess cavity is entered, for incision and drainage. The place of the puncture is chosen over the area of greatest swelling or edema of the abdominal wall or over the place of the most tenderness. If the *x*-ray shows an elevated diaphragm, exploratory puncture is made under the diaphragm.

TREATMENT

The treatment of hepatic abscess following appendicitis can be considered as of a prophylactic nature and that which is concerned with the management of the established abscess. With the early diagnosis of all cases of appendicitis and the early removal of such appendices the incidence of hepatic abscess will be lowered. The infectious foci will be removed and will not be the sites from which bacteria or infected thrombi can originate and enter the portal circulation. The reduction in the occurrence of hepatic abscesses which has taken place in the last thirty years is in a great part due to the early recognition of appendicitis and immediate operation.

If at the time of the appendectomy the veins in the mesoappendix and periappendical veins are found thrombosed, there are some surgical procedures that can be done, which are calculated to reduce the possible development of hepatic abscess and pylephlebitis. These procedures constitute: the removal of the thrombi, the incision and drainage of the thrombosed veins, the ligation and incision of the veins involved, the ligation of the ileocolic vein, or the ligation of the portal vein. Several surgeons have reported cases where some prophylactic measure has been done. Gerster[21] practised the incision and drainage of the infected thrombosed veins that were found; Wilms[11] advised the removal of the veins in the ileocecal angle; Braun[11] performed the ligation of the ileocolic vein. Each has reported cases of recovery. In far advanced cases of thrombophlebitis and pylephlebitis Colp[11] described the ligation of the portal vein in three cases with no recoveries. In regard to the prophylactic measures Thalhimer[41] states, "Every case of acute appendicitis should be considered as an early case of potential pylephlebitis whether there is a history of chills or not. Consequently, the appendix and its neighborhood should always be carefully inspected for the presence of small thrombosed veins so that these can be dealt with."

The management of hepatic abscess following appendicitis is like that of any pyogenic abscess that occurs in the liver from any cause. The object of the surgical measures is to establish drainage of the abscess. The approach of any hepatic abscess is determined by the findings and symptoms of each individual case. The location of the abscess may be such that the method of choice is by making an incision in the right upper quadrant of the abdomen to expose the liver and drain the abscess. This approach was used in the case reported at this time.

Where the abscess is located on the anterior surface of the liver or on the convex surface, the approach will be different. A two stage transpleuro-diaphragmatic operation is utilized in approaching and draining the abscesses in the dome of the liver. Where the abscess is located on the anterior surface a rib resection can be done and a transdiaphragmatic approach below the reflection of the parietal pleura be instituted. In some cases where the abscess is situated on the posterior surface of the liver a similar procedure can be carried out from the back.

As the development of the hepatic abscess may remain obscured for a long time, the general condition of the patient will need supportive treatment. The sepsis can be combated by using blood transfusions and by intravenous injections of glucose solution. These measures are sometimes necessary after the drainage of the hepatic abscess in cases where the individual is greatly weakened.

COMMENT

The occurrence of hepatic abscess following appendicitis does not necessarily mean a fatal condition. With the recognition of the liver abscess and the early establishment of drainage, there is about a 50 per cent chance of recovery. It is needless to say that with the opportunity of saving at least half, these liver abscesses should have the benefit of surgery. The factors which will perhaps improve the present mortality rate are: (1) early diagnosis of appendicitis and early operation; (2) the recognition that the latent and recurring cases of appendicitis are sources of hepatic abscesses; (3) the carrying out of prophylactic measures in indicated cases; and (4) the early diagnosis of hepatic abscess and the early establishment of drainage.

REFERENCES

1. Alessandri, R.: Surgery of the liver. Nelson Surgery, 5:550.
2. Babler, E. A.: Pylephlebitis complicating appendicitis. Ann. Surg., 61:589, 1915.
3. Barlow, R.: Case of acute appendicitis; suppurative pylephlebitis, recovery. The Lancet, 1:844, 1919.

4. Barnes, W. A., and Pearson, L. V.: Suppurative pylephlebitis and hepatic abscess complicating appendicitis: case of recovery. Brit. Med. Jour., 1: 390, 1928.
5. Beer, E.: Ligation of the portal vein in suppurative portal phlebitis. Am. Jour. Med. Sci., 150:548, 1915.
6. Birt, E.: Failure to recognize presence of abscess as a cause of pneumonia and perforating appendicitis, 2 cases. Zentralbl. f. Chir., 55:3214, 1928.
7. Brewer, G. E., and Gies, W. J.: Ligation of the portal vein for hemorrhage during operation on hydatid cyst of the liver. Jour. Am. Med. Assn., 50:2063, 1908.
8. Bruggeman, H. O.: Isolated abscess of the liver complicating appendicitis. Ann. Surg., 65:462, 1917.
9. Christopher, F.: Pylephlebitis of appendical origin simulating lung abscess. Surg. Clin. No. Am., 1:1093, 1921.
10. Christopher, F.: Abscess of the liver following appendicitis. Surg. Clin. No. Am., 3:976, 1923.
11. Colp, R.: The treatment of pylephlebitis of appendicular origin, with a report of three cases of ligation of the portal vein. Surg., Gyn. & Obst., 43: 5, 1923.
12. Colp, R.: Chills in appendicitis. An analysis of 2,841 cases of acute appendicitis treated in Mt. Sinai Hospital, New York. Ann. Surg., 85:257, 1927.
13. Deaver and Ashhurst: Surgery of the upper abdomen. 2nd Ed., 541, 1921.
14. De Planque, P. M.: Liver abscess after appendicitis. Nederl. Tijdschr. v. Geneesk., 70:2834, 1926.
15. Dominici, L.: Abscess of the liver. Clin. Chir., 29:527, 1926.
16. Eliason, E. L.: Pylephlebitis and liver abscess following appendicitis. Surg., Gyn. & Obst., 42:510, 1926.
17. Eliason, E. L.: Trans. Philadelphia Acad. of Med. Ann. Surg., 84:116, 1926.
18. Elsberg, C.: Abscess of the liver. A contribution to the pathology, diagnosis and treatment of this disease, based on the study of 18 cases. Ann. Surg., 44:219, 1906.
19. Fitz, R. H.: Perforating inflammation of the vermiform appendix with special reference to its early diagnosis and treatment. Am. Jour. Med. Sci., 92:321, 1886.
20. George, W.: Appendicitis and hepatic abscess. Brit. Med. Jour., 1:633, 1928.
21. Gerster, A. G.: Trans. Am. Surg. Assoc., 21:39, 1903.
22. Heyd, C. G.: Changes in the liver associated or coincident with infection of the appendix. Jour. Am. Med. Assn., 83:1403, 1924.
23. Hohlbaum, G.: Successful surgical treatment of mesenteric pyemia and hepatic abscess following appendicitis. Zentralbl. f. Chir., 56:859, 1929.
24. Kelly, H. A., and Hurdon, E.: The vermiform appendix and its diseases. J. B. Lippincott Co., 1911.
25. Lane, T. J. D., and Austin, T. A.: Two cases of acute hepatic abscess treated by operation. The Lancet, 212:1232, 1927.
26. Le Calve, J.: Liver diseases from appendicitis, three cases. Rev. méd.-Chir. d. mal. du foie., 2:434, 1927.
27. Lewis, D., and Rosenow, C. E.: Primary portal thrombosis, a statistical and experimental study, with report of a case Arch. Int. Med., 3:232, 1909.
28. Lilienthal, H.: Case report at N. Y. Surg. Soc. Ann. Surg., 56:938, 1912.
29. Lindquist, S.: Four cases of liver abscess following acute gangrenous appendicitis. Acta Chir. Scand., 64:353, 1928.
30. Loison, E.: Des suppurations intra et péri hepatiques. D'origines typhlo-appendiculaire. Rev. de Chir., 21:522, 1900.
31. Loison, E.: Bull. et Mém. de la Soc. de Chir., 26:66, 1900.
32. Martini, C., and Staemmler, M.: Liver abscess in suppurative appendicitis, case. Med. Welt., 2:570, 1928.
33. Munro, J. C.: Lymphatic and hepatic infection secondary to appendicitis. Ann. Surg., 42:692, 1905.
34. Murphy, J. B.: Keen's Surgery, 6:567, 1913.
35. Navarro, J. C.: Post appendicular abscess of the liver. Rev. Soc. argent de nipiol, 1:153, 1925; abst. Jour. Am. Med. Assn., 87:450, 1926.
36. Neuhof, H.: Experimental ligation of the portal vein; its application to the treatment of suppurative pylephlebitis. Surg., Gyn. & Obst., 16:481, 1913.
37. Nieweg, G. A.: Abscess of the liver and right psoas muscle secondary to gangrenous appendix. U. S. Vet. Bur. Med. Bul., 5:58, 1929.
38. Reök, I. von: Abscess of the liver. Zentralbl. f. Chir., 54:196, 1927.
39. Schwartz, J.: Suppuration in the subphrenic region with special reference to primary idiopathic liver and subphrenic abscess. Arch. Surg., 20:317, 1930.
40. Syms, P.: Trans. N. Y. Surg., Soc. Ann. Surg., 49:856, 1909.
41. Thalhimer, W.: Chills occurring early in appendicitis before operation and their indication of an operable stage of pylephlebitis. Arch. Surg., 8:658, 1924.
42. Valdes, U.: Surgical treatment of abscesses of the liver. Surg., Gyn. & Obst., 42:822, 1926.
43. Webb., R. C., and MacFarlane, L. E.: Gibson rubber dam tampon in acute appendicitis. Minn. Med., 6:632, 1923.

VAGINAL HERNIA*

REPORT OF TWO CASES OPERATED

E. K. Green, M.D., and L. K. Buzzelle, M.D.
Minneapolis

THE term hernia is applied to a defect which allows the escape of structures normally held within a cavity. There seems to be a great deal of confusion as to just what constitutes a vaginal hernia. The pelvic floor, which normally acts as a barrier to the abdominal contents and serves to hold the pelvic organs in position, is subject to all sorts of injuries and malformations. The repair of these abnormal conditions constitutes a large proportion of gynecological surgery.

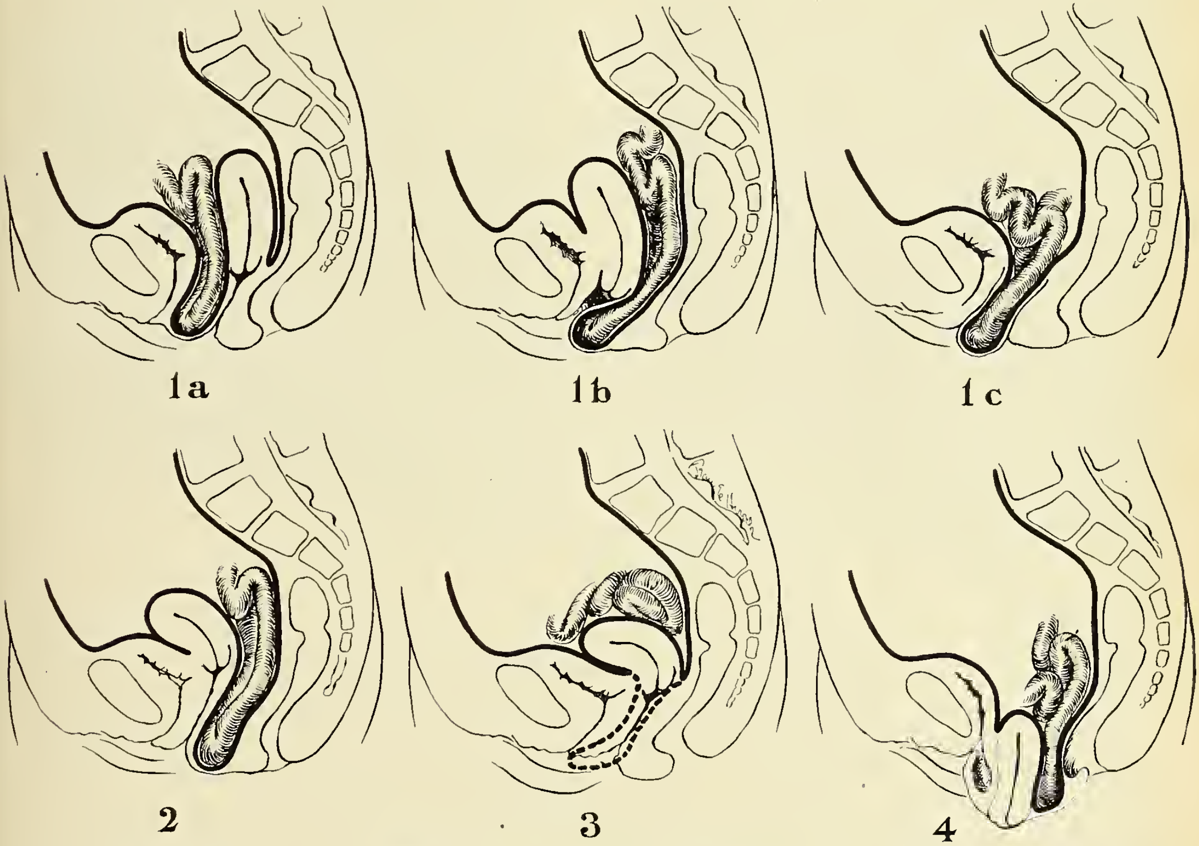


Fig. 1. Diagram showing our classification.

Dr. L. M. Miles of Peking, China, published an article in 1926 in Surgery, Gynecology and Obstetrics in which he reviewed the literature, picked out nine cases which he considered typical, summarized them and reported two of his own. The subject of his article was Pelvic Hernia.

In July, 1928, Dr. J. C. Masson of Rochester in the same magazine reported five cases of a similar nature operated upon at Rochester. The subject of his article was Vaginal Hernia. Obviously the distinguishing point in the minds of both of these authors is that the protrusion which presents itself at the vulva contains abdominal contents such as ascitic fluid or intestines.

Some authors speak of all herniæ in the region of the pelvis as pelvic herniæ and subdivide them according to location or point of egress, while others describe each class separately. We suggest the following classification, which is very similar to that of Dr. Fordyce Barker in his article of 1876.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

Our classification is as follows:

1. True Vaginal
    a. Anterior
    b. Posterior
    c. Post-operative
2. Perineal
3. Pudendal
4. Complete Pelvic

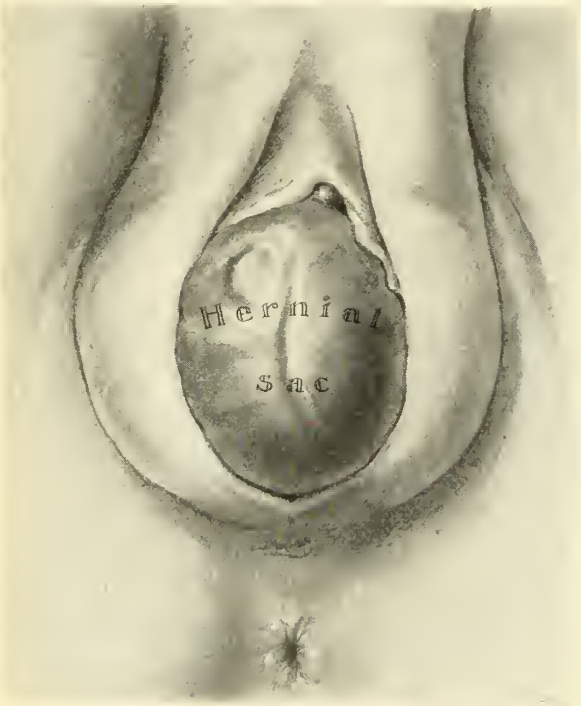


Fig. 2. Case 1. Actual photograph taken on the operating table before operation.

The anterior vaginal hernia dissects its way between the uterus and the bladder, not necessarily producing a cystocele, and appears in the vaginal opening.

The posterior vaginal passes posterior to the uterus and involves the vault of the vagina and recto-vaginal pouch.

The post-operative hernia follows a hysterectomy and passes through the operative scar in the vault of the vagina.

The perineal hernia passes down through the recto-vaginal pouch, leaving the vault of the vagina practically normal, and pushes the vagina forward, appearing in the perineum, usually a little to one side or the other of the median line.

The pudendal hernia dissects its way down through the side of the pelvis and appears in the labia majora.

The complete pelvic hernia involves all the structures of the pelvis. Besides containing intestines or abdominal contents, we find the bladder, uterus, rectum and vagina involved with much distortion and displacement.

Our two cases according to this classification fall into the true vaginal type, one posterior and the other post-operative.

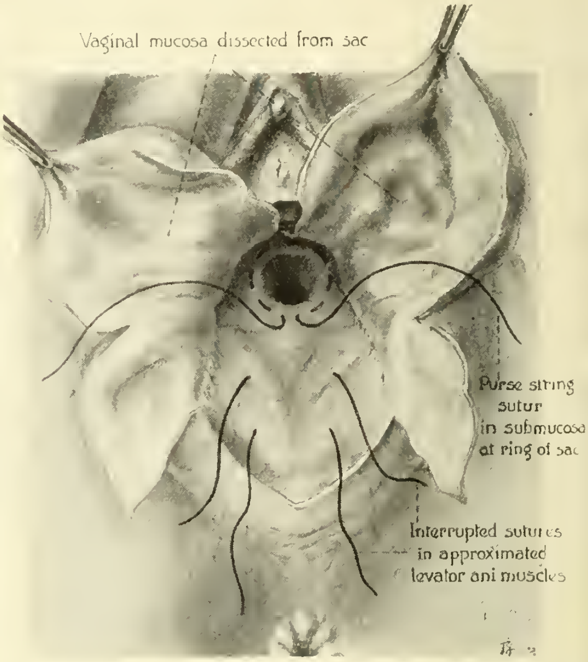

Vaginal mucosa dissected from sac
Purse string sutur in submucosa at ring of sac
Interrupted sutures in approximated levator ani muscles

Fig. 3. Case 1. Flaps dissected up and the hernial sac pushed up into the abdominal cavity

CASE REPORTS

Case 1.—Mrs. G., fifty-two years of age, has had five labors. She was thirty-two at the time of her first labor, which was very difficult, and she was delivered with forceps by Dr. Green.

She first came to our office with the present complaint in June, 1928, desiring a support. Operation was advised but she refused.

She came back again January 15, 1929. Examination revealed a mass protruding from the vulva about four inches in width with two deep ulcerations. This mass contained intestines and was easily pushed through the vagina up into the abdominal cavity. The uterus was in good position, there was no appreciable cystocele and no definite rectocele, though the rectal wall was somewhat lax. She was first operated upon per vagina. The peritoneal sac was freed and pushed up into the abdominal cavity and packed with gauze. The redundant vaginal wall was removed and a high perineal repair was made, bringing the levators together after closing the sac with chronic purse-string sutures.

The abdomen was then opened, the gauze removed from the inverted sac, and the sac sewed to the posterior wall of the uterus. The culdesac was then closed after the manner of Moskowitz, suturing the bowel and uterus together in such a way as to obliterate the recto-vaginal pouch.

Examination several weeks later showed no signs of recurrence.

Case 2.—Mrs. P., sixty-two years of age, had had five children. The first at twenty-two years of age, was delivered by a midwife with forceps. At forty-nine she was operated upon by the late Dr. J. Warren Little for complete uterine prolapse. A vaginal hysterectomy and perineal repair was done.

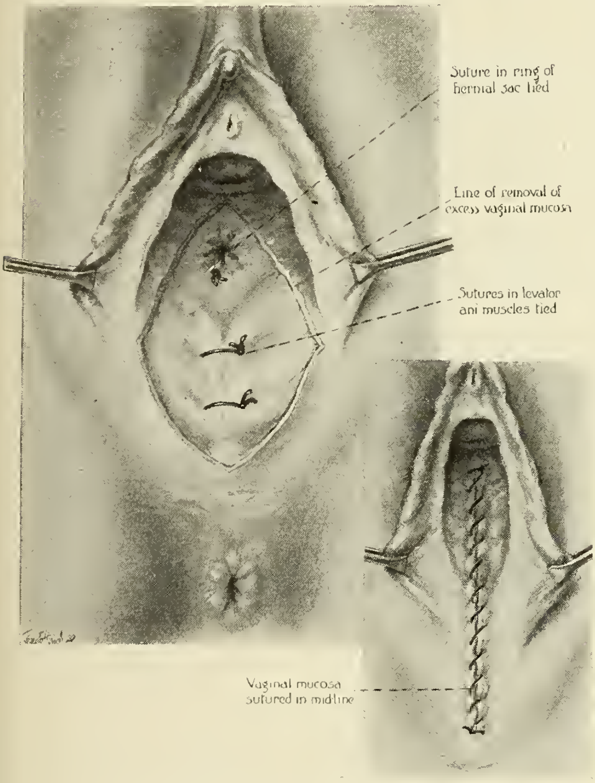

Suture in ring of hernial sac tied
Line of removal of excess vaginal mucosa
Sutures in levator ani muscles tied
Vaginal mucosa sutured in midline

Fig. 4. Case 1. Final perineal repair.

She came to our office January 10, 1929, with a mass about the size of a small orange protruding through the vaginal scar and presenting at the vulva. The hernia, which occupied the whole vagina, contained intestines and could be easily reduced into the abdominal cavity. There was no cystocele or rectocele.

Our operative procedure was as follows: The hernia was reduced and held in the abdomen by a piece of gauze on a forceps while the abdominal operation was begun. After freeing the peritoneum from the hernia, the vaginal portion was pushed down into the vagina, packed with gauze and left while the opening in the sac was closed by chromic purse-string sutures. The broad ligaments were brought together and sutured to reinforce the outlet. We then did the vaginal operation. The redundant tissues were removed and a high perineal repair was done.

Examination some weeks later showed some laxness of the posterior vaginal wall but no recurrence of the hernia.

LITERATURE

In going over the literature it is interesting to note how the various authors who have written on this subject classify their cases.

Dr. Fordyce Barker as early as June, 1876, wrote an article in *The American Journal of Obstetrics,* already referred to in this paper, on the subject of Vaginal Hernia, in which he reported four cases of his own, all complicating delivery. He also mentioned nine other cases in the article and reported one as far back as 1710 by Garengeot. These cases, however, are not sufficiently described to render them fit for classification.

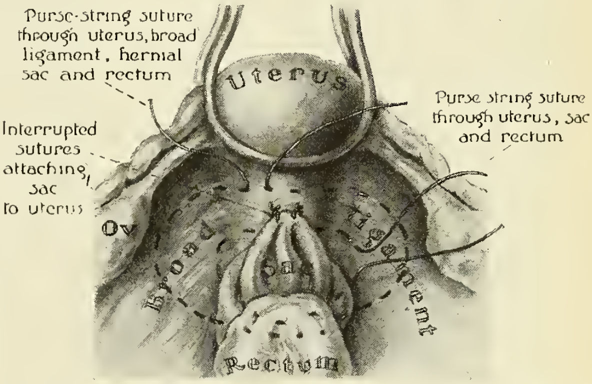

Purse-string suture through uterus, broad ligament, hernial sac and rectum
Uterus
Purse string suture through uterus, sac and rectum
Interrupted sutures attaching sac to uterus
Ov
Broad
Sac
ligament
Rectum

Fig. 5, Case 1. Method of Moschowitz in fastening the bowel to the posterior wall of the uterus.

Nine years later, Dr. T. Gaillard Thomas wrote quite an extensive article in the *New York Medical Journal* on the subject of Vulvar and Vaginal Enterocele. He gave us the first report of a vaginal hernia properly diagnosed and successfully operated upon. The case was one of the posterior vaginal type of an enormous size reaching half way down the thigh. The operation consisted of reducing the hernia and sewing the sac into the abdominal wound. In his article he reported about twenty other cases. We would like to comment on three of these in which there was a mistaken preoperative diagnosis.

In one, the doctor thinking the hernia was an abscess, opened it and found strangulated intestines. The patient died. In another, a tumor complicating delivery was thought to be a cyst, but in attempting to empty it with a trocar, feces were obtained. In the third, there was a sloughing mass in the vagina that was thought to be a uterine polyp. It was removed and a postmortem examination revealed that a portion of the transverse colon and omentum had been removed. Most of his cases were difficult to classify, as was the case in Dr. Barker's article.

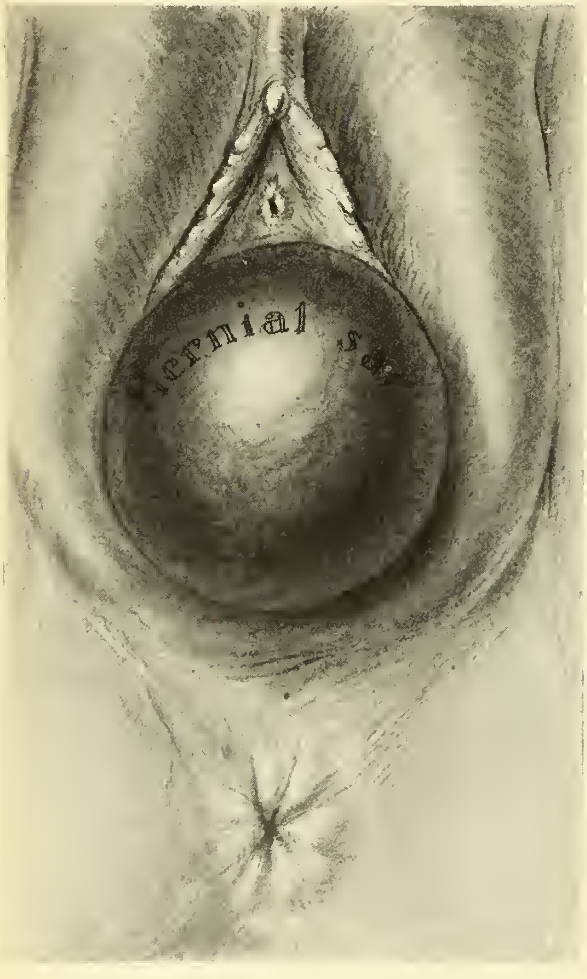


Fig. 6. Case 2. Actual photograph taken on the operating table before operation.

The borderline case is one that is always difficult to dispose of. For example, Dr. George Gray Ward in a very good article in the August, 1922, *Journal of American Medical Association,* on the subject of Technic in Repair of Enterocele or Vaginal Hernia, reported fourteen cases operated upon, three of which had to be reoperated because of mistaken diagnoses. He described these cases as having a particularly low recto-vaginal pouch.

According to our classification we hardly know whether they would be considered posterior vaginal, perineal, or a combination of both, or neither, as some authors suggest.

Dr. Herbert C. Chase, on the other hand, in the December, 1922, *Surgery, Gynecology and Obstetrics,* wrote an article on Levator Hernia (or Pudendal Hernia), in which he reported thirteen cases. Five were operated upon with three failures and two cures. In his article he does not consider them as vaginal hernias at all, yet he speaks of some as obstructing the vaginal outlet and others as pressing the vagina over throughout its entire length.

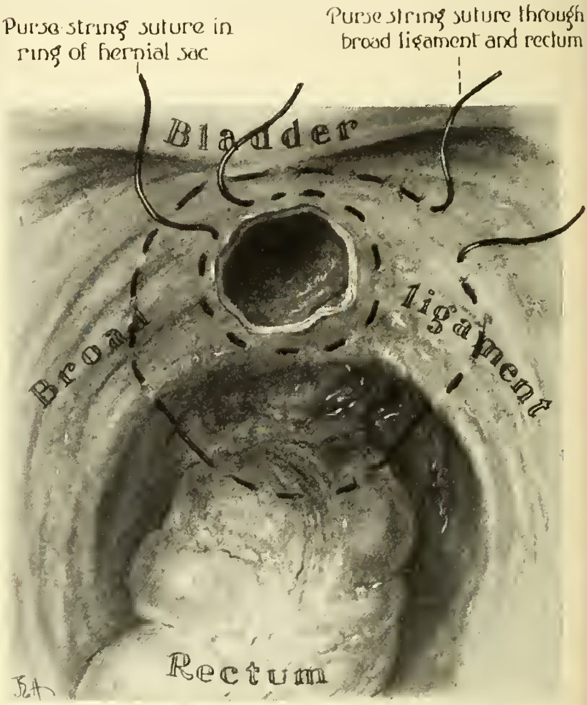

Purse string suture in ring of hernial sac
Purse string suture through broad ligament and rectum
Bladder
Broad ligament
Rectum

Fig. 7. Case 2. The abdominal method of closing the hernial sac.

In reviewing the literature and trying to classify the cases we are led to believe that, out of fifty or sixty cases reported, probably a comparatively few, perhaps ten or twelve, would be of the true vaginal type, with about an equal number of the perineal type. Among the rest there would be a few of the complete pelvic type, while the remainder would be borderline cases.

The complete pelvic hernia deserves special mention here because it seems altogether probable that if all cases of complete prolapse were carefully investigated, the intestines would be found to be involved in a certain number.

ETIOLOGY

The great majority of cases reported occurred in multipara, but a sufficient number of nullipara were reported (notably Dr. H. B. Sweetser's case) to lead us to believe that a large percentage, if not all of the cases, have a congenital defect which gives way either gradually or at the time of an accident. There is no question, however, that labor is the largest contributory factor. There are three cases reported by Dr. Thomas where an opening was made through the vault of the vagina by external force which allowed intestines to escape into the vagina. One was in a woman who, in attempting to produce an abortion, tore a hole with a douche point. The other two were produced by reputable physicians, one in forcibly examining a patient, and the other in trying to replace a retroverted uterus with gauze on a sponge holder. Strange to say, all these patients recovered. We are inclined to agree with some authors who seem to think these cases are not hernias at all, but we consider them of sufficient interest to mention.

SYMPTOMS AND DIAGNOSIS

The symptoms in these cases are not unlike those of severe laceration or extreme prolapse except when strangulation takes place, as it did in a number of cases. The doctors reporting strangulation during labor seemed to think the character of the pain was so different from that of labor pain that a diagnosis should be made.

The greatest difficulty in diagnosis is the rarity of the condition, which is evidenced by the fact that so many of the patients were operated upon for other conditions before the true diagnosis was made. In our two cases, the diagnosis was easy because a large tumor was present containing intestines which could easily be reduced and a large defect was felt in the vault of the vagina.

TREATMENT

Palliative treatment such as use of supports is of no value at all in these cases. The only treatment is operation. The procedure should be determined in each individual case.

In the true vaginal type, the best method to pursue is the two-stage operation. Whether the vaginal or the abdominal portion should be done first should be left to the discretion of the operator. We did one each way. Dr. Masson waited three weeks for the vaginal operation in one of his cases, which undoubtedly was good judgment.

In some of the perineal types, a one-stage operation does very well if the sac can be freed and tied off high up and the rectum and the vagina sutured together.

In the complete pelvic type occasionally a vaginal hysterectomy with high perineal repair might be sufficient.

SUMMARY

1. Vaginal hernia is a very rare condition.
2. Care should be taken in examining gynecological patients not to overlook a complicating hernia.
3. The cause undoubtedly is twofold: congenital and traumatic.
4. The classification is difficult because of the adjacent pelvic structures.
5. The symptoms are not characteristic except in case of strangulation.
6. The only treatment is operation.

BIBLIOGRAPHY

1. Chase, H. C.: Levator hernia (pudendal hernia). Surg., Gynec. and Obst., 35:717, 1922.
2. Moschcowitz, A. V.: Prolapse of the rectum. Surg., Gynec. and Obst., 15:7, 1912.
3. Idem: Perineal hernia. Surg., Gynec. and Obst., 26:514, 1918.
4. Bandler, S. W.: Most frequent form of vaginal hernia; its etiology and treatment. Med. Rec., 62:644, 1902. Vaginal hernia. Med. Gynec., 4th Edition, 1924.
5. Barker, Fordyce: Vaginal hernia, or vaginal enterocele. Am. J. Obst., 9:177, 1876.
6. Lothrop, H. A.: An operation for the cure of vaginal hernia. Boston Med. and Surg. Jour., 168: 578, 1913.
7. Miles, L. M.: Pelvic hernia, report of a case of posterior vaginal hernia. Surg., Gynec. and Obst., 42:482, 1926.
8. Sweetser, H. E.: Vaginal hernia. Ann. Surg., 69:609, 1919.
9. Thomas, H. T.: Vulvar and vaginal enterocele. New York Med. Jour., 42:705, 1885.
10. Ward, G. G.: Technic of repair of enterocele (posterior vaginal hernia) and rectocele. Jour. Am. Med. Assn., 79:709, 1922.

THE PHYSICANS' COÖPERATION IN PUBLIC HEALTH ADMINISTRATION*

F. E. Harrington, M.D., Commissioner of Health
Minneapolis

A REVIEW of the program for this, the Sixty-Second Annual Session of The Minnesota State Medical Association, furnishes perhaps the best reason for a paper of this title. There are two factors in the program which makes a public health discussion advisable. The first one is the program of the Monday evening session on the economic trend of medicine, and the second is the almost entire absence of any public health paper on the program.

Public health as a legal entity has been with us since early colonial days. Public health as a philanthropy, more properly public welfare, has been the physicians' contribution to humanity from the dark ages. The modern trend in the healing arts is making public health as a legal factor more of an entity than it was in the days when public health was included in the province of medicine. Public health as constituted by law no longer limits its application to the medical field. It must deal with subject matters beyond the practice of medicine and in its contacts and relationships recognizes the legal responsibilities imposed by law on the so-called irregular practitioner. Legislative acts throughout the country recognizing the practice of osteopathy, chiropractic, and naturopathy have given to these schools of practice the same rights and privileges from the public health standpoint as have always been enjoyed by the physician in medicine. The chiropractic law of Minnesota passed by the 1919 Legislature has in it the following:

> "Chiropractors shall be subject to the same rules and regulations, both municipal and state, that govern other licensed doctors or physicians in the control of contagious and infectious diseases, and shall be entitled to all rights and privileges of other doctors or physicians in all matters pertaining to the public health."

The very phraseology used in this paragraph of the law definitely presupposes that there are rules and regulations, both municipal and state, that govern physicians in their practice with its relations to the public health. It is the interpretation and application of these rules and regulations, including of course the legislative acts and municipal ordinances, that constitute the grounds for misunderstandings that so frequently occur between the practitioner on the one hand and the administrator of public health on the other. The time has come, in fact the time has been with us for many years, when public health must be accorded its legal, moral, ethical, and just status. Too long has public health been tolerated rather than supported.

The Women's Auxiliary of the American Medical Association in their program now before our State Public Health Education Committee offers rather a striking outline of activity leading to the proper recognition of the public health. There are five fundamentals upon which this program is based. I would, had I it in my power, add a sixth and very important fundamental. My sixth fundamental would read, "Recognition of the fact that no health department of whatever kind can do effective work without the intelligent coöperation of the medical profession."

In the economic strain of today the profession is looking for a means to equalize the demands of the public. It sums itself up in this phrase: private practice versus state medicine. The public health field must be distinguished from the field of public welfare. Public welfare is public relief and medical care of the poor. Not being public health it will not be discussed here. There can properly be no argument that the field of public health is leading to state medicine. Public health is an activity constituted by law and controlled by limitations of the law enacted for the protection of all the people. It is believed, however, that public health stands as a sentinel to safeguard the public in matters beyond the ability of the individual physician or group of physicians. To the end that public health may be judiciously administered the medical profession as a body must support it. It seems to me rather a travesty on the medical profession's support of the public health when we glance at the figures of the recent meeting of the American Medical

---

*Presented at the annual meeting of the Minnesota State Medical Association, Duluth, July 16, 1930.

Association in Detroit. Of a total registration of 5,104 only 167 registered as affiliated with the section on preventive and industrial medicine and public health. If this is indicative of the profession's interest then certainly public health must take its stand alone, for it is required by law to carry on. A division of interest, however slight, between the two great factors, the practitioner of medicine as an agent of private health, and the directors of health as agents of the public health, will result in a material loss to both sides and to the public.

An active campaign for the support, appreciation and understanding of public health must be started. This session of the State Association, representing as it does medicine in all its branches, should not do less than to actively support a strong, properly organized, properly equipped, and financially supported central health agency for the State. Minnesota with its two and one-half million population deserves the protection which a strong State Board of Health can give. Our State is not keeping progress with the march of events in central health control. The progressive West is far behind the East in this matter. Minnesota is sadly in need of the county unit of health administration. The present system of township health unit dates from the territorial days. In municipalities public health administration is as important as any other phase of municipal government. It should be supported by the medical profession. The functions of state, county, and municipal health in engineering, laboratories, epidemiology, vital statistics, and abatement of nuisances are functions for the best interests of all of the people. It is beyond the province or the power of the medical profession to safeguard water supplies, milk supplies, to safeguard meats and other food supplies for the masses, to provide and execute control measures in communicable diseases, to conduct laboratories and make epidemiological studies, and to collect and tabulate statistics. Until these facts are understood and appreciated public health must function as an activity seemingly not in accord with the practitioner.

All seasons have been open seasons for public health departments. Many physicians consider it their duty to safeguard the patient rather than the public often in a manner contrary to the laws laid down, but there can be no misunderstanding of the paragraph quoted above. There are unquestionably obligations imposed upon the physician who practices his profession by right of state license. A license is a privilege and withal a protection, but carries with it certain obligations and duties, for the law creating the license is no stronger than the law creating limitations. The rights of the individual can never be made greater than the rights of the masses, and the public health workers are for the protection of the masses. The physician who falsifies a record of birth to hide a crime or for the presumed or alleged interest of his patient, the physician who falsifies the records of death for the presumed benefit of a bereaved family at the expense of a life insurance company, the physician who conceals the existence of a communicable disease because of the supposed inconvenience to the patient and family, or who deliberately fails to diagnose a reportable disease, notably tuberculosis and venereal diseases, or who permits infected children to mingle with other children, is no better than the criminal armed to commit murder, or the drunken automobile driver irresponsible for the results of his negligence. If the laws of public health in the State of Minnesota are wrong it is within the province of this Association to rectify them. If the laws on public health in the State of Minnesota are just and reasonable then it should be the duty of this Association to encourage and counsel compliance with them. A definite stand on law enforcement for the protection of the public health is a positive act.

It has been the policy of the Minneapolis Department of Health to limit its activities as much as possible to the things that could not be done by the individual physician. In the administration of the public as well as the school health every possible means has been taken to place in the hands of the physician those duties and functions which are properly his. The Health Department maintains no field physicians for the check-up of the diagnoses made by the family physician in communicable diseases. The Health Department does not stand forth with a big stick but conducts its activities as a coöperative measure doing for the public what the public laws demand, the things that the private practitioner cannot perform. The school health activities are discovery and not corrective. Because of the opportunity presented at a time when children are by law congregated and under discipline, existing defects are looked for and reported only in group. All of these activities result in sending to the physician those patients for the correction of conditions either retarding or mitigating against the future growth of the child. It is disheartening to say the least to find the physician who scoffs at all of the work the public health departments are putting forth, who finds fault with the methods of weeding out and sending to his office the school children needing professional attention, or who takes it upon himself to misinform his families of the requirements of quarantine. Happily, these physicians are in the great minority, but I am convinced that it is possible through the efforts of the Association and its components, the county societies, to make public health a business of the community with the support of the fraternity and with a benefit to the people at large.

May I invite your attention to the first article in the Journal of the American Medical Association, Volume 94, Number 15, April 12, 1930?

A SUMMARY OF THE RECORDS OF SIXTY-FIVE CASES OF RECOVERIES FROM LEPROSY

A report recently issued by the Public Health Service gives an interesting summary of the value of medical treatment for leprosy at the National Leprosarium, which is conducted by the Public Health Service at Carville, La. More than 300 lepers, men, women, and children, are under treatment there.

During the past ten years, 65 lepers have been discharged from this hospital as apparently recovered from leprosy and no longer a menace to the public health. The average period of hospital care varied from 5 to 9 years. The shortest period of treatment was 1½ years and the longest was 17 years. Fifty-five of these patients received crude chaulmoogra oil by mouth, and sixteen of this group received no other medicine. Twelve received benzocaine-chaulmoogra oil by intramuscular injection, and four of these received no other medical treatment. Twenty-one received the ethyl esters of chaulmoogra oil by intramuscular injection, and eight of these received no other medicine.

The basic treatment of leprosy is similar to that for tuberculosis, and all lepers at the National Leprosarium, no matter what medicines are given, follow a sanatorium of food, fresh air and rest, almost identical with that prevailing in a tuberculosis hospital.

ROENTGEN DIAGNOSIS OF SYNOVIAL ADHESIONS

Another chemical adjunct to roentgen diagnosis seems to be available. With this new aid, altered permeability of synovial membranes can be determined and accurate pictures secured of synovial adhesions. This substance is a disodium salt of tetraiodo-orthosulphobenzoic acid. The substance is reported to be relatively non-toxic and to be well borne when injected. (Jour. A. M. A., December 6, 1930, p. 1749.)

ORAL IMMUNIZATION AGAINST PNEUMOCOCCI

Thus far, laboratory studies concerning oral immunization against specific infections have not been encouraging. Most of the suggested oral vaccines apparently are rapidly destroyed or denatured in the gastro-intestinal tract. Oral immunization will presumably be limited to the relatively few vaccines sufficiently resistant to gastro-intestinal denaturization. The most resistant group of micro-organisms are apparently the pneumococci. Recently, successful oral vaccines against pneumococci are reported to have been developed by Dr. Victor Ross. It is to be hoped that Ross's encouraging researches will not be handicapped by premature clinical or commercial exploitation. (Jour. A. M. A., October 4, 1930, p. 1024.)

PERMANENT DISABILITIES OF THE EXTREMITIES*

A PROPOSED RATING SCHEDULE

Myron O. Henry, M.D., F.A.C.S., and Edward T. Evans, M.D., F.A.C.S.
Minneapolis

SURGEONS vary greatly in their estimates of certain permanent disabilities of the extremities submitted to State Industrial Commissions, and often confusion and unnecessary litigation follows. The tentative schedule presented herewith is intended to help clarify the present unsatisfactory situation. Completeness and details have been sacrificed for the sake of brevity. The ratings are purposely high in favor of the claimant in the hope of stabilizing a maximum rating for the specific disabilities. Each state has its own law, of course, but the disabilities are constant, and bear the same relative loss of use to the individual under any law. The following schedule considers *objective* findings only, but the rating might be varied up to 10 per cent of the specific disability percentage to cover *subjective* complaints of pain.

These ratings are based on the *dexterous* extremity, *i.e.,* the right arm in a right-handed individual, or the left arm in a left-handed individual, and the rating should be reduced by 10 per cent of the specific disability percentage for the non-dexterous extremity.

All ratings are given in percentage loss of use of the extremity as a whole. The basis for the arm, *e.g.,* is complete loss of use — amputation at the shoulder (or with too short a stump to permit a useful prosthesis). Loss of an extremity is usually defined by the various state laws (*e.g.,* Minnesota Law allows 66.33 per cent of 200 weeks pay for complete loss of an arm). Loss of motion is rated according to the percentage of normal range lost —the ratings given herewith covering complete loss of normal arc. We recommend the use of instruments of precision in arriving at an estimate of the degrees of joint motion lost.

Multiple disabilities of an extremity are rated as the sum of the individual joint disabilities, the maximum not to exceed loss of the extremity.

Disfigurement is not compensable unless so serious as to materially affect employability of the injured.

Disabilities of nerves and muscles are referred to the limitation of arcs of active motion of joints involved, except as special nerve injuries obviously require additional coverage.

UPPER EXTREMITY

The upper extremity includes the shoulder girdle. Total loss of the upper extremity is usually defined by local state law.

I. *Sterno-clavicular Joint*

a. Ankylosis b. Chronic dislocation	rate according to resulting loss of active shoulder joint motion

II. *Clavicle*

a. Complete loss b. Non-union c. Mal-union	rate according to resulting loss of active shoulder joint motion

III. *Acromio-clavicular Joint*
    a. Ankylosis—as above
    b. Dislocation
        1. Incomplete (conoid and trapezoid ligaments intact)—5%
        2. Complete (conoid and trapezoid ligaments torn)—rate according to resulting loss of active shoulder joint motion

IV. *Scapula*

a. Malunion b. Loss of blade or body	rate according to resulting loss of shoulder joint motion

V. *Shoulder*
    a. Flail—40 per cent loss of extremity (unless rating for loss of motion exceeds this, in which case rate on loss of motion)
    b. Ankylosis—in Jones position (20° in front of coronal plane, 50° abduction) —60 per cent.

---

*A Committee Report to the Minnesota Orthopedic Club.

c. Ankylosis in bad position—if operable 75 per cent (may be total loss of extremity if inoperable, *i.e.*, patient a poor operative risk)

d. Loss of Motion

1. Loss of elevation (useful arc normally 90° from shoulder level to vertical)—35 per cent
2. Loss of abduction (useful arc normally 90° from side to shoulder level)—80 per cent. Arc refers to any plane and rotation is necessarily limited in proportion and covered in arc loss rating

VI. *Arm*

a. Amputation—at or above elbow—loss of extremity

b. Amputation—4 inches or more below elbow (permitting use of elbow in prosthesis)—85 per cent of arm

c. Shortening—nil unless actually disabling or seriously disfiguring

VII. *Elbow*

a. Flail—Same as ankylosis in good position plus rating for loss of motion

b. Ankylosis in Jones position (at an angle of 110°)—40 per cent

c. Ankylosis in bad position—

1. Acute angle—if inoperable total of arm. If operable, 60 per cent of arm
2. Obtuse angle of 110° to 155°—50 per cent
3. Obtuse angle of 155° to 180°—75 per cent

d. Distortion of carrying angle of elbow (15° valgus)—10 per cent maximum in heavy workers

e. Loss of Motion

1. Loss of flexion beyond acute angle of 80°—not compensable
2. Loss of motion (useful arc normally 80° to 175°)—rated on percentage loss of this range up to 75 per cent maximum

f. 1. Loss of pronation-supination alone (in Jones position, *i.e.*, midway between pronation-supination) — 20 per cent

2. Loss of pronation-supination alone in bad position—30 per cent
3. Loss of pronation-supination alone in Jones position when combined with disabilities of wrist or elbow constitutes an additional 15 per cent disability
4. Loss of pronation-supination in bad position when combined with disabilities of wrist or elbow constitutes an additional 20 per cent disability

VIII. *Wrist*

a. Flail—Same as ankylosis in good position plus rating for loss of motion up to 75 per cent maximum

b. Ankylosis (in Jones position, *i.e.*, at an angle of 135°)—25 per cent

c. Ankylosis in bad position (*i.e.*, straight or in volar flexion)—if operable 30-50 per cent—may be loss of hand if inoperable)

d. Loss of motion—percentage loss of arc (of 25 per cent)

1. Flexion-extension (75 per cent of wrist joint motion)—18.5 per cent of extremity. Useful arc normally 165°
2. Radial and ulnar abduction (25 per cent of wrist joint motion)—6.5 per cent. Useful arc normally 30° each

IX. *Hand*—Total loss—85 per cent of extremity (includes forearm loss to 4 inches below elbow)

Partial loss—rated on loss of finger function

1. Thumb

a. Total loss—30 per cent of extremity

b. Ankylosis in good position (extended in apposition)—20 per cent

c. Ankylosis in bad position—same as total loss if inoperable, if operable 25 per cent

d. Loss of terminal phalanx—15 per cent

e. Loss of metacarpo-phalangeal joint motion—20 per cent

f. Loss of interphalangeal joint motion—percentage of loss of arc of 15 per cent. (Normal mal range 90°)

2. Index finger (first finger)
    a. Total loss—16 per cent of extremity
    b. Loss of one and a half or more phalanges—16 per cent
    c. Loss of terminal phalanx—8 per cent
    d. Loss of interphalangeal joint motion or ankylosis
        (1) Distal joint—percentage of of loss of arc of 8 per cent
        (2) Proximal joint — percentage of loss of arc of 10 per cent
3. Middle finger (second finger)
    a. Total loss—14 per cent of extremity
    b. Other ratings same proportion of 14 per cent as in index finger
4. Ring finger (third finger)
    a. Total loss—10 per cent
    b. Other ratings same proportion of 10 per cent as in index finger
5. Little finger (fourth finger)
    a. Total loss—5 per cent
    b. Other ratings same proportion of 5 per cent as in index finger

The accrued rating for loss of use of more than one finger should not exceed the total loss of a hand as provided above.

LOWER EXTREMITY*

Since most state laws give no definite ratings for disabilities of spine, no attempt has been made to rate the spine or the spinal portion of the pelvis. Ratings on pelvis are covered in this schedule only as the disability limits hip motion, shortening of extremities, or both.

I. *Lower Extremity*
  a. Amputation
    1. Stump of less than 6 inches—100 per cent
    2. Useful stump 6 inches below hip—87½ per cent
    3. Amputation 3 inches or more below knee (useful stump)—75 per cent
    4. Amputation of foot without loss of ankle motion—50 per cent
  b. Shortening**
    1. One inch—no disability
    2. One inch to 2 inches—10 per cent
    3. Two inches to 3 inches—35 per cent
    4. More than 3 inches—35 per cent to 75 per cent

II. *Hip Joint*
  a. Ankylosis in optimum position (15° flexion—10° abduction and slight external rotation or a proportionate increase in abduction dependent on shortening**)—60 per cent loss of extremity
  b. Ankylosis in bad position—75 per cent to 100 per cent if inoperable
  c. Loss of motion
    1. Flexion-extension (45 per cent of hip motion)—useful arc normally 120° of which flexion is 105°—extension 15°
    2. Abduction-adduction (22½ per cent of hip motion)—useful arc normally 90° of which abduction is 45°—adduction 45°
    3. Internal and external rotation (7.5 per cent of hip motion)—useful arc normally 90° of which internal rotation is 45°—external rotation 45°

Formula: The proportionate part of flexion (45 per cent), plus the proportionate part of abduction (22½ per cent), plus the proportionate part of rotation (7½ per cent), equals the disability.***

III. *Knee*
  a. Flail—75 per cent
  b. Ankylosis in good position (at an angle of 170° to 150°)—60 per cent
  c. Ankylosis in bad position (at an angle of less than 140°—if inoperable)—87½ per cent

---

*Just as in shoulder joint, so in the hip joint, motions are considered with reference to the pelvic girdle as a whole; whereas scapular motion completes the upper extremity to some extent, this does not play so great a part in the lower extremity, except in some fractures of the pelvis, especially of the acetabulum. However, the mobility of the hip joint is so great that the authors deemed it wise to classify these motions with specific values for each, so that the total disability present could be readily ascertained.

**Optimum position depends on amount of shortening. See table of abduction. Jones & Lovett, p. 138.

***In rating the hip, the proportionate loss of flexion should be added to the proportionate loss of abduction and rotation, thus, if two-thirds flexion is lost, the flexion disability will be two-thirds of 45 per cent, or 30 per cent. If two-thirds of abduction and adduction are lost, the disability will be two-thirds of 22.5 per cent, or 15 per cent. With rotation completely lost or 7.5 per cent, the disability of the hip would be the sum of these three figures, or 52.5 per cent.

d. Loss of motion
  1. Flexion-extension—useful arc normally 180° to 75°

(Formula: The proportionate loss of arc of 60 per cent.)

  2. Extension limited to less than 160° —same as ankylosis in bad position
  3. Abnormal lateral mobility—10 per cent to 30 per cent
  4. Relaxation of either or both crucial ligaments and other internal derangements—10 per cent to 40 per cent

V. *Ankle*

a. Flail—50 per cent
b. Ankylosis in good position—25 per cent
c. Ankylosis in bad position (calcaneus or over 20° plantar flexion)—if inoperable—50 per cent
d. Subastragalar ankylosis in good position—15 per cent
e. Partial ankylosis of subastragalar joints (always painful)—35 per cent if inoperable
f. Loss of motion
  1. Dorsiflexion (24 per cent of extremity) useful arc 90° to 70°
  2. Plantar flexion (16 per cent of extremity)—useful arc 90° to 125°

Formula: The proportionate part of dorsiflexion (24 per cent) plus the proportionate part of plantar flexion (16 per cent) equals the disability (*e.g.*, in estimating the disability in ankle motions, the proportionate loss of dorsiflexion is considered as that proportion of 24 per cent, and added to the proportionate loss of plantar flexion which is represented by a total value of 16 per cent.)

g. Loss of the foot
  1. With loss of ankle joint motion—67½ per cent
  2. Amputation proximal to heads of metatarsals (loss of weight bearing)—67½ per cent. (In our experience such amputations usually require rating as for amputations above the ankle or loss of ankle motion)
  3. Loss of metatarsals rated as the proportionate loss of weight bearing (which if total is specified in paragraph 2 as 67½ per cent)
  4. Great toe
    a. Amputation at metatarso-phalangeal joint—10 per cent
    b. Amputation at interphalangeal joint—5 per cent
    c. Loss of motion (hallux rigidus) —15 per cent
  5. Other toes
    a. Total loss—3 per cent
    b. Partial loss—1½ per cent

For their kind advice and help in preparing this schedule, the authors extend their thanks to the following: Dr. W. A. Cochrane, Edinburgh, Scotland; Dr. Wallace Cole, St. Paul, Minnesota; Dr. H. E. Conwell, Birmingham, Alabama; Dr. Emil S. Geist, Minneapolis, Minnesota; Dr. Robert B. Osgood, Boston, Mass.; and Dr. Phillip D. Wilson, Boston, Mass.

CASE REPORT

AN UNUSUAL CASE OF HYPERTENSION

Charles Koenigsberger, M.D.
Mankato, Minnesota

This case is brought to your attention because of its failure of classification. Instances of vascular hypertensive disease usually drop quite simply into the proper slot—essential hypertension, glomerulonephritis, toxemia of pregnancy, and the like. Cases may manifest bizarre clinical features, but the classification of the fundamental type is scarcely ever baffling. This case, I believe, is very unusual if not unique.

The patient is a young man, aged 29, by occupation a plumber. During January of this year, while working in St. Paul, he had a severe attack of septic sore throat, at which time cultures showed streptococcus. He went to his home at St. James to recuperate. Shortly after his arrival at home, he had a tonsillectomy performed by his local physician. A few days after this operation, he commenced having very severe upper abdominal colic; so severe, in fact, that his physician considered the diagnosis of biliary or renal colic.

Early in February he came to the Mankato Clinic, and was hospitalized for observation. The striking feature of the examination was a vascular tension of 180/140. The heart was only a trifle enlarged; the rate was rapid and the diastolic sounds were accentuated. The vessel at the wrist showed very little, if any, thickening. The retinal vessels showed a moderate narrowing of the arteries, no notching, and no hemorrhage in either retina. The urine was normal, there being no signs of a glomerulonephritis.

During his stay in the hospital he had repeated attacks of three different types of pain:

1. Abdominal: The pain was severe, cramping in type, and unaccompanied by fever, vomiting, or physical signs of visceral disease.
2. Cerebral. The pain was that of a generalized, very severe headache.
3. Coronary. The pain was that of a typical attack of angina pectoris. Hypodermic administration of a quarter of a grain of morphine with one-hundredth of a grain of nitroglycerine invariably produced immediate relief. The use of nitroglycerine alone has caused immediate cessation of pain, but the relief was very transitory unless the drug was combined with morphine.

About two weeks after admission the patient developed repeated periods of angina and his condition was, in my opinion, critical. At this time I invited Dr. Edwin Bannick of the Mayo Clinic in consultation. Dr. Bannick will recite his impression of this case when I have completed this brief clinical description.

The kidneys at no time gave trouble. The intake and output balanced well. The function as determined by blood chemistry and the phenolsulphonephthalein test was only slightly impaired, and there was at no time evidence of any glomerulonephritis.

The eye grounds remained clear of exudate or hemorrhage. No symptoms or sign of cerebral hemorrhage or thrombosis developed.

The heart gave a great deal of trouble symptomatically. Anginal attacks of extreme severity continued almost daily for about five weeks. The pulse was rapid—the rhythm was of the gallop type. The electrocardiogram showed an inverted T wave in Lead one with a convex ST interval. The patient was given regular doses of nitroglycerine and morphine by hypodermic, and erythmyl-tetra-nitrate and euphyllin by mouth. About five weeks after admission, improvement commenced. The attacks of pain ceased, and the patient went home at his own request on March 22.

I have seen him a few times since. He continues without pain, is gaining weight, and is able to do light work.

During his entire illness, the blood pressure remained systolic 150 to 180 and diastolic 110 to 140, and on April 26th, when I last saw him in the office, the reading was 170/120.

Biopsy of a bit of pectoral muscle was made and will be described by Dr. Bannick.

This, then, is a case of acute diffuse vaso-spastic disease following a streptococcic throat infection, characterized by involvement of the splanchnic, cerebral and cardiac vessels, and escape of the kidneys, the extremities, and the retinæ.

From the first I considered the existence of malignant hypertension, but the lack of retinal findings precludes this diagnosis.

PRESIDENT'S LETTER

I WONDER how many of our members are aware of the importance to us of the Women's State Auxiliary and its affiliated County Auxiliaries.

This well organized and energetic group is also affiliated with the National Auxiliary; has been so affiliated since the very year the National Auxiliary was organized at St. Louis in 1922. Three of its County Medical Auxiliaries, Hennepin, St. Louis and Ramsey, are among the earliest organizations of the sort in the entire United States.

These women, in their thirteen affiliated Minnesota societies and their similar union with other auxiliaries of all but ten unorganized states of the union, have a very simple, a very definite object in view. It is to further the aims and ideals of the medical profession. Have we not, sometimes, rather overlooked these powerful allies of our organization?

Lay health education is a new thing for the doctor, a rather bewildering obligation that modern social and economic developments have thrust upon us. It is probably not strange that we should have had a tendency to wander far afield, tilting at distant windmills.

We have very properly embarked upon newspaper and radio and platform publicity at considerable expense and labor. But it is certainly high time that we also made practical use of our auxiliaries in our program of public health education.

The physician's wife is likely to be a very important person in her community. Often she has a variety of social, charitable and public affiliations. She is interested in Woman's Club work, in cultural groups of all sorts. Her contacts are the sort that the physician himself cannot make except impersonally from the platform or through the newspaper.

It seems to me to be the most obvious and elementary good sense that we should employ an important part of our educational effort at keeping the physician's wife posted on sound public health procedure, on new developments in medicine, on the worth of medical care, on the social problems that face the doctor. Her testimony in and out of her auxiliary organization is more valuable to the cause of medicine than tons of formal exhortation and she is eager to testify.

In Minnesota we have, I am convinced, the most effective, earnest auxiliary organization in the entire United States. At the present time it has thirteen affiliated societies, representing, just as our County Medical Societies do, many more than thirteen counties. But with our assistance and encouragement this number will be very quickly extended.

It is my ambition, in fact, to see an auxiliary established for every component county medical society in our association this year. To this end every member of the association should make it a point to talk over auxiliary possibilities and membership with his wife—urge membership upon her if she is not already a member and assist her to organize a society where there is no society.

In the nine years of their existence, the auxiliaries have been of immense service to our organization but they welcome further coöperation. They ask our advice. LET US USE THEM!

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE
A. S. HAMILTON, M.D.......Minneapolis
D. C. BALFOUR, M.D.......Rochester
J. T. CHRISTISON, M.D.......St. Paul
E. L. GARDNER, M.D.......Minneapolis
JOHN M. ARMSTRONG, M.D.......St. Paul
R. E. FARR, M.D.......Minneapolis

CARL B. DRAKE, M.D., St. Paul.......Editor
Lewis M. Daniel, M.D., Minneapolis.......Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna.......First District
F. M. Manson, M.D., Worthington.......Second District
Geo. B. Weiser, M.D., New Ulm.......Third District
H. B. Aitkens, M.D., LeSueur Center.......Fourth District
F. U. Davis, M.D., Faribault.......Fifth District
E. L. Gardner, M.D., Minneapolis.......Sixth District
Paul Kenyon, M.D., Wadena.......Seventh District
O. E. Locken, M.D., Crookston.......Eighth District
E. L. Tuohy, M.D., Duluth.......Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV February, 1931 No. 2

UNIVERSITY SUPPORT

The question of appropriations for University maintenance and development comes before the legislature at each session. A brief but comprehensive survey of the present situation and the needs of the University has been prepared in pamphlet form by the Regents for the information of those interested. The determining of what constitutes a proper appropriation and the distributing of the available funds each year to meet the demands of the various University departments is a huge administrative task.

The demand for university education has increased tremendously in recent years. If the universities throughout the country continue to grow faster than the nation's population there is bound to come a time when adequate facilities will be available for that percentage of the youth of the country that merits the investment of a university training. It is interesting to conjecture just when that point will be reached. Perhaps it has already come.

Our state university has grown tremendously during recent years. Last year the enrollment increased over a thousand and has now surpassed that of Iowa, Wisconsin, Illinois, and Michigan. Legislative appropriations, however, have not kept pace with this growth. Minnesota suffers by comparison with neighboring state universities. The annual per capita appropriation at Wisconsin last year was $306; at Iowa, $345; at Illinois, $412; at Michigan, $467; while at Minnesota it was but $234.

What must be the result of such a comparatively low appropriation? Unless tuition is increased, the instruction must suffer. Larger classes, poorer professors and instructors and a low morale which always accompanies underpay must of necessity follow. Of course, entrance requirements can always be raised to cut down matriculation.

The so-called private universities depend on endowments instead of legislative appropriations. Millions are added each year to their resources. The present suggestion of the Board of Regents that an endowment fund be established for the University is not new. With the waning in the natural resources of the state in its forests, mines and rich top soil, the ability of the state to care properly for the University in future years is questionable. The suggestion is made that the sum of two and a quarter millions of dollars be set aside yearly for an endowment and the appropriation this year be made on the basis of $252 per student. With this increase of income from endowment it is felt that no increase in appropriations need be made and by the end of a ten year period it is hoped that the biennial appropriation might even be reduced.

The medical school alumni are particularly interested in the welfare of the medical school.

The loss of three outstanding members of the medical faculty recently was, as far as we know, simply an inability to compete with a wealthier institution. This has caused some concern in medical circles but faculty losses from the same cause have not been limited to the medical school.

In the plans outlined for the Medical School in the report mentioned, attention is called to the long standing need for a psychopathic division of the University Hospital. An increase of $75,000 in the present University Hospital appropriation of $300,000 (half of which is borne by the various counties) would fill the hospital and reduce the waiting list of indigent patients throughout the state. The Anatomy building and Millard Hall will sooner or later need additions. Eventually the two blocks across the street from Millard Hall and the University Hospital will have to be acquired for medical school purposes and then a building to be used in training leaders in Public Health is needed and according to estimates will cost about $150,000.

We have a fine University. To maintain it as one of the best in the country requires financial backing, and devotion on the part of its graduates. Last year gifts from friends, alumni and commercial concerns to the University for various university activities amounted to a half million dollars. This was more than has been usually received as gifts by the University. The object is most worthy and the practice should be encouraged. The legislature will do its part and the combined efforts of alumni, legislators, and friends should assure the future of the institution.

THE RECENT QUESTIONNAIRE

The writer ventures this editorial although he may be inviting criticism from some excellent medical workers who may feel that they are misjudged. Apparently the county society memberships are circularized with a series of ten questions relative to State Association and County Society matters, redistricting, the matter of dues, reserve funds, etc.

There can be no doubt that redistricting certain county societies to arrange a membership that is not too small for effective organization (none less than fifty members) seems plausible. Nevertheless, the matter of roads, availability, keen physicians, endowed with scientific aspirations, wholesome discontent and forbearance in the presence of medical polemics—are all very vital in this question of what may develop an effective medical society.

Should the northern and southern medical associations be eliminated in order that the ebbing medical circulation should the more fully circularize the outpost members of the parent organization? This is another evidence of the lament of the A. M. A., and those interested should go back over this journal's editorials for one by this writer entitled "Our Perturbed Organizers." Much correspondence and not a little discussion arose anent that offering, and the end is not yet!

Question 6—"Are you satisfied with the enlarged program of activities—educational, scientific and legislative—which the State organization has engaged in during recent years?" The writer is too happy wilfully to wish to be thoughtless or unkind, but an old conviction mounts to a greater and greater certainty that this program is, for the most part, illogical, and quite ignores our social and professional relations with other community groups.

As to increasing dues (which seems unthinkable at this time), or creating further legislative plans or education reserves, if the program itself is ill advised, the danger arises of converting our State association into a political bund, and the question is easily disposed of. The association and its meetings must not be made the occasion (like an automobile show) of exhibiting the most recent models of medical social machinery. This objectivity only interests those who are engaged in the twilight zone between scientific medicine and utopian social exploits, usually involving mankind's reformation as well as exploitation. These movements are presently unpopular. Like Congressmen seeking an extra session, the increasing army in these pursuits betokens the influence of unemployment in terms of college graduates.

E. L. T.

DR. WILLIAM A. JONES

The passing of Dr. W. A. Jones marks a milestone in medical journalism in our section of the country, as it brings to a close his long incumbency as an editor of the *Journal-Lancet*. Although nationally known as a neurologist his name will ever be associated with that of his journal.

To go back to the beginning of medical journalism in Minnesota, it was in June, 1870, that Dr. Alexander J. Stone, then of Stillwater, published the first number of the *Northwestern Medical and Surgical Journal.* After changing ownership this publication was suspended in May, 1874. In October, 1881, Dr. Jay Owens of Saint Paul began the publication of the *Northwestern Lancet,* which in September, 1886, was purchased by Dr. Stone, he becoming the nominal editor. Thus the connection between the *Northwestern Lancet* and the earlier publication begun in 1870. The associate and active editor of the *Northwestern Lancet* during these years of Dr. Stone's ownership was Dr. William Davis of Saint Paul. It was at the beginning of the present century that Dr. Jones began his direction of the *Northwestern Lancet,* destined in 1912 to change its name to the *Journal-Lancet.* That Dr. Jones, a busy neurologist, was able to continue his direction of the *Lancet* for so long a period testifies to his abundance of energy and to his ability. It should be mentioned that Dr. Jones was ably assisted during this period by Mr. W. L. Klein, publisher since 1887 and himself a recognized editor as well as publisher.

At the annual state medical meeting held in 1917 in Saint Paul, a disagreement as to policies proper for a journal representing the state association led to the establishment of MINNESOTA MEDICINE, owned and controlled by the State Association, and to the termination of the *Saint Paul Medical Journal,* which had been in existence since 1899.

Few medical men in Minnesota enjoyed a wider acquaintance than did Dr. W. A. Jones of Minneapolis. Few indeed had such a wide circle of friends—tried and true. A man of strong likes and dislikes, of indomitable energy, Dr. Jones did much to mould medical opinions in the Northwest. The *Lancet* has reflected Dr. Jones during this period of his editorship and the *Lancet* has been admittedly our worthy rival. We are sincere when we say that MINNESOTA MEDICINE has been a better journal because of Dr. W. A. Jones.

HISTORY COMMITTEE

Medical men have often done many things outside their profession. Many have abandoned medicine for business. Some have written poetry; others have entered the political arena and what not. Who was the President of the United States who started to study medicine? Since no President of the United States so far as is known ever was a resident of Minnesota you will not find the answer to the above in our forthcoming book.

To return to the original subject. The man I have in mind entered the army after practicing medicine for twenty years, as a Captain of Infantry; was discharged from the service a Brigadier General and then resumed the practice of medicine and followed it for twenty-one years longer. When our History of Medicine in Minnesota is completed you may read about him and many others who served in the Civil War. Please forward to Doctor Workman whatever scraps of Minnesota medical history you may be able to supply.

J. M. A.

THE GERM-LADEN BUCKET

How queer to me now are the scenes of my childhood;
Just to think of the place I was born, reared and grew
Makes me shudder and break out in cold perspiration;
It's the greatest of wonders I ever pulled through.

The pig-pen, the stable, the manure pile hard by it
From which flies ascended in one steady swarm;
Our food was uncovered, no screens in the windows.
"Why bother with trifles? Flies don't do any harm."

The ditch with the drainage, the garbage, and chickens,
The outhouse all added their quotas of smell.
And right in the middle, with germ-laden bucket,
Was the open-top, ramshackle, shallow, dug well.

The brook and the meadow with grass-bordered puddles
Gave mosquitos the finest of places to breed.
Did they bite us? I'll say so, with vicious abandon.
Sanitation was then our direst need.

In spite of the romance, the rocks and the rivers
Do you wonder we suffered with fever and chills?
But the old country doctor with germs in his whiskers
Dosed us up once a week with physic and pills.

In winter, ah then came the joys of the country!
The windows were nailed shut for once and for all.
Saturday night meant a bath for the entire family
In the moss-covered wash-tub that stood by the wall.

Did we thrive on this life however poetic?
Were we healthy in those fond glamorous days?
There was no disease organic or catching
That missed us in infancy, manhood, or age.

Take your childhood, its pleasures and moss-covered buckets
The simple life joys of which we hear tell.
I prefer middle age, sanitation. and business
And up-to-date science to help me keep well.

(Used by permission of the American Public Health Association, owners of the copyright. The poem is a part of the Syndicated Health Bulletin Service, issued monthly for the use of health organizations by the A. P. H. A.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

"PEOPLE IN BUTTONS"

Gilbert K. Chesterton has turned another witty phrase. This one was to the benefit of the medical profession, and every perspiring doctor, trying hard to convey in words just what a medical bureaucracy might mean, will surely thank him.

Mr. Chesterton is reported to have said in Chicago, the other day: "The panel system of medical practise or its allied systems is merely delegation of the practise of medicine to a GROUP OF PEOPLE IN BUTTONS."

That is, of course, what every champion of private medical practise has been feeling and attempting to say about State Medicine ever since that bogie first raised a menacing head in the American social picture. Mr. Chesterton said it in a word.

"I am against people in buttons interfering with the rights of any man," said the famous English philosopher and satirist, expanding his remark in an interview on the British medical situation which should interest every American medical man.

"The theory of the rational modern state is against bureaucracy. The dole is a tragic thing. So is any measure that metes out a perpetual interference with individual rights and free contacts of the citizenry. Which is exactly what the panel system does. It removes from one class of people the right to make free contacts for individual necessities.

"It is an evil thing when you classify and codify and put into a system of law a recognition of employers and employees as variant classes to be so shown under any constitution. It is an evil thing to deprive the poor of the privilege of choice and to make for them a sort of serfdom.

"The world is in danger right now of getting up an intellectual tree through the utterance of too many platitudes," adds Mr. Chesterton wisely. Prohibition is putting America into something approaching that embarrassing position incidentally, he thinks.

"Prohibition," he says, "is an onslaught against private morality and as such a menace to good government."

But it is comforting to note that, in Mr. Chesterton's important and witty opinion, the world and modern rational government is probably not on its way to destruction.

"Already," he says, "the pendulum has begun to swing back. Amusing reform movements are the paradoxical but inevitable companions of an eager plunge into so-called secret, evil things. But even the pornographers are getting tired. They have almost exhausted the possibilities of exploitation of sex.

"And it is interesting to note that there is another side of the question. There is a search and seeking everywhere in the world for religious experience. Even the British newspapers find nothing of more interest to print than stories of religion and religious experience. The world is a right world, but like all that is mortal it is destined to trial, struggle and tribulation."

OF GENERAL INTEREST

Dr. Raymond J. Josewski of Stillwater, Minnesota, was married to Ruth E. Welch, also of Stillwater, Minnesota, September 6, 1930.

Dr. Henry E. Michelson of Minneapolis was elected president of the Chicago Dermatological Society at the meeting held January 21, 1931.

At the annual meeting of the Ancker Hospital staff, January 13, 1931, Dr. E. M. Jones was elected chief of staff and Dr. Philip Donohue was re-elected secretary.

Word has just been received of the marriage of Dr. Elwyn V. Strand of Bayport, Minnesota, to Mary Johnson of South Saint Paul, Minnesota, which occurred July 5, 1930.

Dr. John F. Madden addressed the Blue Earth County Medical Society at Mankato on "Diagnosis and Treatment of Common Skin Diseases," on the evening of January 8, 1931.

Dr. G. E. Schoofs of North Branch, Minnesota, has been appointed Secretary of the Chisago-Pine County Medical Society. Dr. R. E. Hultkrans, the former Secretary, has moved to Minneapolis, Minnesota.

The Minnesota State Medical Association sponsored the evening of December 29, 1930, as part of the St. Louis County Medical Society Colloquium short course. Drs. E. A. Meyerding, N. O. Pearce and L. Sogge were present.

Dr. John R. Spannuth, formerly of the Mayo Clinic, Rochester, Minnesota, and a member of the Olmsted County Medical Society, has announced the opening of offices at Suite 502, Medical Arts Bldg., 230 North Fifth Street, Reading, Pennsylvania.

At the meeting of the Minnesota Academy of Medicine, held January 14, 1931, the following were elected to membership: Drs. Kenneth Bulkley and Moses Barron, of Minneapolis; Drs. John F. Noble, Max Hoffman and Clayton Williams, of Saint Paul; Drs. Irvine McQuarrie and O. H. Wangensteen of the University.

The International Journal of Medicine and Surgery recently offered three prizes for the best papers presented before the American Association of Railway Surgeons. Dr. John H. Rishmiller, Minneapolis, has been awarded second prize—Wilmot Castle Sterilizer—for an essay on "Habitual Dislocation of the Shoulder Joint."

The following letter from the State Board of Medical Examiners gives information of interest to all physicians practicing in the State of Minnesota:

> "The matter relative to incorporating a group of doctors was presented at our Board meeting held December 2, 1930, and the secretary was instructed to advise that the Board absolutely disapproves of a corporation attempting to practice medicine, and that, in the event an attempt is made, it will take such action as it deems necessary under the circumstances to put an end thereto."

The Josiah Macy, Jr., Foundation has made a grant of $7,200 for the year 1931, to be expended under the direction of Dr. Walter C. Alvarez of the Mayo Foundation in the field of gastro-enterological research. The first fellowship made available by this fund has been granted to Dr. Frances Vanzant, who will work primarily on the physiology of gastric secretion in man and animals. There will be an opportunity for another fellow to work on the pathology of the digestive tract including the nerve supply, and for another to work on problems along the borderline between clinical medicine and physiology.

On December 31, 1930, there were 2,064 paid memberships in the Minnesota State Medical Association. The following is a list of the percentage membership in the component county societies:

RANK	COUNTY	PERCENTAGE
1.	Rice County	.92
2.	Meeker County	.89
3.	Watonwan County	.88
4.	Olmsted County	.87
5.	Freeborn County	.86
6.	Scott-Carver County	.86
7.	Kandiyohi-Swift County	.84
8.	West Central Minnesota	.82
9.	McLeod County	.80
10.	Redwood-Brown County	.80
11.	Winona County	.80
12.	Red River Valley	.80
13.	Chisago-Pine County	.79
14.	Stearns-Benton County	.79
15.	Nicollet-Le Sueur County	.79
16.	Mower County	.77
17.	Southwestern Minnesota	77
18.	Blue Earth County	.76
19.	Blue Earth Valley	.76
20.	Waseca County	.75
21.	St. Louis County	.75
22.	Lyon-Lincoln County	.73
23.	Camp Release County	.72
24.	Wabasha County	.71
25.	Houston-Fillmore County	.69
26.	Wright County	.67
27.	Ramsey County	.67
28.	Washington County	.65
29.	Park Region	.63
30.	Hennepin County	.62
31.	Goodhue County	.58
32.	Upper Mississippi	.57
33.	Steele County	.56
34.	Dodge County	.55
35.	Clay-Becker County	.49
36.	Central Minnesota	.42
	AVERAGE PERCENTAGE FOR STATE	.73

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I understand that an instruction sheet for patients with constipation is being used with much success at the University Hospital's Outpatient Department. Please send me information concerning the same.

   Answer.—The Medical Clinic of the Out-patient Department kindly supplied the following information. The instruction sheet is worded as follows: "Chronic constipation is in most cases entirely unnecessary. The seat of constipation is the large bowel, which represents about the last five feet of the intestinal tract. Many symptoms may develop as a result of improper functioning of this tract. The abuse of cathartics, enemas, and irritating foods are often responsible for aggravating trouble there. *Stools*—Most individuals should have one or two normal stools per day. A normal stool is about the size and consistency of a small peeled banana. Constipated stools are usually hard and dry and may be ball-like or pencil-like in shape. An effort should be made to have a bowel movement at a regular time each day. *Cathartics and Enemas*—No medicine of any kind is to be taken for bowel movements. No large enemas are to be used (1-2 quarts). *Diet in Constipation*—The use of the proper fruits and vegetables in sufficient amount is the most important factor in treating constipation. Fruit is to be taken three times daily; cooked fruits are usually preferable to fresh fruits. Some of the best are: prunes, apricots, baked apple, apple sauce, rhubarb, pear and peach sauce. Vegetables—GREEN COOKED VEGETABLES are to be taken in liberal amounts for both the noon and the night meal. Their chief value is that they contain bulk food which will pass into the large bowel and furnish material for bowel movements. Some of the best green cooked vegetables are: spinach, string beans, beets, carrots, greens, squash, peas, asparagus and cauliflower. Cabbage is often undesirable and should not be used in most instances. The fruits and vegetables are the foods which largely regulate the bowel movements and should be taken in the required amounts. This will vary for different individuals. The amount of fruit must not be in excess with too few vegetables. The test of sufficient bulk is whether or not the individual is having daily normal stools. If too much bulk the stools will be loose, which calls for a cut in the amount of fruit being taken. *FOODS TO AVOID*—Bran is an objectionable food as it is too coarse for most human beings. It is usually advisable to avoid ice cold drinks and sweets. Other food may be taken much as desired, the important factor being a sufficient amount of bulk food in the form of cooked fruits and cooked vegetables. Early in the treatment of constipation there may be difficulty having normal stools. If no bowel movement has been had for two days, it is advisable to inject two or three ounces of olive oil or salad oil into the rectum at bedtime and leave in overnight. If no bowel movement has been had by the next morning a 1 pint of clear water enema may be used."

2. *Question.*—I have removed a suspected epithelioma from the lower lip of a man 66 years of age, and sent the specimen to the laboratory for examination. If epithelioma, will radium treatment be indicated? If so, when should it be used and how should it be applied? Please discuss the proper treatment of epithelioma of the lips.

   Answer.—If a positive diagnosis has been returned and the lesion has been widely excised (V incision), nothing further need be done to the lip. At the University Hospitals and many other places throughout this country routine resection of the nodes of the neck is made in cases of epithelioma of the lower lip. Another treatment which is sometimes used, especially by radiologists, is radiation of both the primary and the nodes. In our experience, the best results are obtained when the lip is either radiated or widely removed by a "V" incision and the nodes of the neck are resected.

3. *Question.*—I would like to get some information as to the relative merits of diphtheria toxoid and toxin-antitoxin in the prophylaxis of diphtheria. 2. What is the youngest age that it is advisable to give either for the prophylaxis of diphtheria? 3. I would also like to have an opinion as to the merits of the new Dick six dose prophylaxis against scarlet fever and the advisability of giving it to babies of one year of age. 4. I am taking care of some babies who are now in apparently perfect health, and wish to advise the parents as to prophylaxis against the various diseases. Would it be advisable to give 11 months old babies prophylaxis against diphtheria, scarlet fever, and smallpox at this time?

   Answer.—1. Diphtheria toxoid and toxin-antitoxin are equal in value as far as prophylaxis is concerned. In addition toxoid does not have the danger of possible anaphylaxis. 2. The youngest advisable age to give either for the prophylaxis of diphtheria is six months. It is usually recommended at the ninth month because natural immunity runs out at this time. Any time within the first year is all right; nine to twelve months is usually the recommended time. 3. Prophylaxis against scarlet fever has not been popular. The probable reasons are: failure to guarantee any sort of result, and secondly the severe reactions which frequently occur. If parents would have it given to their children with these reservations, I see no harm in offering it to your patients. 4. The 11 months old babies should be vaccinated at once against diphtheria, using toxoid. Give the injections one week apart, either three or four, and on the last injection vaccinate the girls on the lower leg, and the boys on the arm against smallpox. It is not necessary to do a Schick test for at least six months. After that, if the parents still want to have the scarlet fever done, it could be given. It is recommended that you give them in this order—diphtheria, smallpox, then scarlet fever.

4. *Question.*—I have a patient with trouble in her pelvis. The history is as follows: She is about

(Continued on page 191)

OBITUARY

Theodor Bratrud

1873-1930

Dr. Theodor Bratrud, pioneer surgeon of Warren, Minnesota, died suddenly at his home December 6, 1930.

Theodor Bratrud was born at Fountain, Fillmore County, Minnesota, February 14, 1873. He received his early preliminary education at Spring Valley, Minnesota. He graduated from the University of Minnesota in 1898 with the degrees of Bachelor of Arts and Doctor of Medicine, and immediately came to Warren, Minnesota, where he practiced until his death. Besides the countless number of friends, Dr. Bratrud leaves to mourn six brothers, namely, Christ of Sioux Falls, South Dakota; John and Oscar of Tacoma, Washington; Albert of Spring Valley, Minnesota; Edward of Warren; and Arthur of Minneapolis, Minnesota.

Coming to Warren in 1899 after finishing his course in medicine, Dr. Bratrud availed himself of the opportunities in the then young Red River Valley and through conscientious study and painstaking work earned for himself a reputation, not only locally but also nationally. In 1904 he founded the Warren Hospital, with which institution he was connected until late in 1926, since which time he has operated an independent hospital and clinic. His associates in this field were Dr. Edward Bratrud and Dr. David Berge. Dr. Bratrud's latest great deed was the founding of the new St. Luke's Hospital in Thief River Falls, Minnesota. He was to have been chief of staff of this new $100,000 structure.

The doctor had added to his early medical education by post-graduate work in Europe in 1904 and 1927, and also by attending all the leading clinics in the United States at regular intervals. He was a member of the Red River Valley Medical and Minnesota State Societies, Minnesota Academy of Medicine, and American College of Surgeons. He was also councilor and member of the Credentials Committee of the American College of Surgeons. He contributed many original and splendid articles to the medical literature. He belonged to several fraternal and social organizations, including the Masons, the Shriners, the I. O. O. F. and the Minneapolis Athletic Club. He was a physician and surgeon for the Soo Line.

During his long years of highly successful practice Dr. Bratrud showed much unselfishness through philanthropical gifts. "There are few men in the Northwest who have contributed so much to Church and State as Dr. Bratrud has." "In the passing of Dr. Bratrud we have lost in him one of America's great surgeons."

Resolution of the Red River Valley Medical Society:

WHEREAS, The Red River Valley Medical Society has sustained a loss in the death of our colleague, Dr. Theodor Bratrud, one of the pioneer doctors and one of the pioneer members of our society, who departed this life on December 12, 1930, at Warren, Minnesota.

WHEREAS, he was one of the leading surgeons of his community and the Northwest, deeply interested in the advance of scientific medicine, charitable to the poor and to the Church, and always ready to aid in all those things that were for the betterment of the profession.

THEREFORE, BE IT RESOLVED, that we, the members of the Red River Valley Medical Association, express our appreciation for the years of devoted service and fellowship and extend to the saddened family the sympathy of the society.

RESOLVED, that a copy of this resolution be embodied in the minutes of our society, and that a copy be sent to the family as a tribute in memory of our colleague.

J. F. Norman, M.D., *Chairman,*
H. H. Hodgson, M.D.,
C. L. Oppegaard, M.D., *Sec'y-Treas.*

Dr. William A. Jones

1859-1931

Dr. William A. Jones, well-known neurologist of Minneapolis, died at the Northwestern Hospital on January 15, at the age of seventy-one. Dr. Jones was not only one of the pioneer Minnesota physicians but he was one of the first physicians in Minnesota to specialize in neurology. As editor of the *Journal-Lancet* since 1901, Dr. Jones has also been actively identified with medical journalism in the Northwest.

Born at St. Peter, Minnesota, in 1859, Dr. Jones came of Scotch and Welsh ancestry and both of his grandsires were soldiers in the Revolution. His parents came west in the early days and braved the dangers of frontier life in Minnesota.

After attending grade and high school in St. Peter, Dr. Jones first studied the drug business in his father's store. Later he took up the study of medicine at the University of the City of New York, where he graduated in 1881. After graduation he became assistant physician at the State Hospital for the Insane at St. Peter.

From 1883 to 1886, Dr. Jones practiced in Minneapolis. After his marriage in 1887 to Annie R. Johnson of Denver, he went with his wife to Europe, where he took special work in the study of nervous diseases, in Berlin and Vienna. Upon returning to Minneapolis he limited his practice to nervous and mental diseases and became clinical professor of this specialty at the University.

At various times he was president of the American Neurological Association, the Minnesota Academy of Medicine and the Hennepin County Medical Society. From 1905 to 1917 he was president of the Minnesota State Board of Health and in 1914 was chairman of the section of nervous diseases of the American Medical Association. In 1928, as vice president of the American Medical Association, he was very active in planning the convention of that body in Minneapolis. Dr. Jones was a member of the Westminster Presbyterian Church, the Minneapolis, University, and Minikahda Clubs of Minneapolis, and the Minnesota Club of Saint

Paul. He is survived by his wife and a sister, Mrs. J. W. Bell, of Minneapolis.

Dr. Fred A. Swartwood

1860-1930

Dr. Fred A. Swartwood, a practicing physician in Waseca, Minnesota, for a period of forty years, died at his home, Wednesday evening, November 12, 1930, aged 69 years. Death followed a year's illness and was due to heart failure.

Born at Cannon City, Rice county, on December 8, 1860, Dr. Swartwood was a son of the Hon. Henry A. Swartwood, who came to Minnesota in 1857 and later served in the legislature Dr. Swartwood attended the public schools of his district, took a four year course at Carleton College, Northfield, and graduated from the Medical College at Ann Arbor, Mich., in 1886. His marriage to Miss Ida M. Poe of Northfield took place on November 20 of that year and they came to Waseca to make their home the next month.

Dr. Swartwood was active in Republican politics, serving as party leader in the county, and was postmaster under the administrations of McKinley, Roosevelt and Taft. In 1920 he was elected mayor and was re-elected for the two succeeding years. During this time he instituted the movements resulting in the building of the Waseca Memorial Hospital.

He enjoyed a wide popularity among railroad men and had served as physician and surgeon for the C. & N. W. Ry. since the war. He was always a hard worker and was capable of performing an immense amount of labor.

Mrs. Swartwood and a son and a daughter survive. The children are Harold Swartwood of Chicago and Mrs. Mark (Madeline) Moore of Waseca. Two grandsons, Mark, Jr., and Henry Moore; a sister, Mrs. Edward Pike; and a brother, Carlton Swartwood, both of Minneapolis, also survive.

THE PROPHYLAXIS OF COCAINE AND ALLIED INTOXICANTS

A study to determine the efficiency of barbital compounds in the detoxication of local anesthetics has been made. The minimal tolerated and minimal lethal doses of cocaine, procaine and butyn for rabbits were determined without protection and after the administration of various depressants. The depressants found effective and in the order of their efficacy were urethane (ethyl carbamate), chloral hydrate, paraldehyde, barbital, phenobarbital, and isoamylethyl-barbituric acid, the last named being the most effective. The investigators find that there are two types of intoxication into which clinical cases may be divided. One has a prolonged course and death results from primary respiratory failure; the other has a short course and death results from primary cardiac failure. The first type is reproduced experimentally by subcutaneous injection of cocaine, the second type by intravenous injection. Against this second type of intoxication the depressants are valueless. (Jour. A. M. A., December 13, 1930, p. 1839.)

MISCELLANEOUS

A SATISFACTORY METHOD OF OBTAINING PROSTATIC AND SEMINAL VESICULAR SECRETIONS FOR BACTERIAL STAINING

William P. Herbst, M.D.

Minneapolis

The two most generally used methods of staining prostatic and seminal vesicular secretions for the identification of microörganisms present are: (1) Usual stains of dried secretion films on slides; (2) usual stains of sedimented urine voided immediately following prostatic and seminal vesicular massage.

The results obtained by the first method are uniformly unsatisfactory because the secretion is either washed off in staining or one sees only conglomerate masses of stain with no possibility of identifying the microörganisms through it. This holds true except in secretions which have lost their normal constituents through prolonged and severe infections resulting in the secretion being pure pus.

The results of stains of the urine which has washed the urethra of its expressed secretions are satisfactory as far as identification of the contained bacteria are concerned, but the fact that the urine itself frequently contains microörganisms or pus, or both, makes this method inaccurate.

These methods are in use by all the technicians and physicians in many hospitals and private laboratories questioned by the writer.

A satisfactory method is as follows:

1. Irrigate the urethra with any antiseptic solution desired after complete emptying of the bladder.
2. Massage either the prostate or seminal vesicles, or both, with the finger per rectum, instructing the patient to compress the glans penis so that the secretion will not be allowed to run out until desired.
3. Allow the secretion to run into 4 c.c. of sterile water in a centrifuge tube.
4. Shake the mixture and centrifuge 3 to 5 minutes.
5. Stain the sediment smears by any staining method desired.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

QUACK DOCTER DENIED CITIZENSHIP BY FEDERAL COURT

"Doctor" George, alias George Garoponlo, alias George Denison Georgeopoulous, who was arrested in St. Paul July 2, 1929, charged with violating the Basic Science Law, and who, on October 7, entered a plea of guilty and was fined $250.00, had his petition for citizenship denied in Federal Court December 22, 1930, by the Hon. J. W. Molyneaux, Judge of the Federal Court.

Investigation by the Government disclosed "Doctor" George had told an entirely different story than the statement of facts to which he plead guilty. The Government requested that Mr. Brist, attorney for the State Board of Medical Examiners, appear in Court at the hearing on the applicant's petition for citizenship.

Immediately at the termination of the hearing Judge Molyneaux denied George's application to become a citizen. Judge Molyneaux informed the applicant that the Court was not admitting anyone to citizenship unless they made a showing of a good moral character and respect for the law.

SCHOOL SUPERINTENDENT SENTENCED FOR VIOLATING THE BASIC SCIENCE LAW

State of Minnesota vs. Edward L. Schmidt

On November 20, 1930, Edward L. Schmidt of the Public School Board at Meadow Lands, Minnesota, entered a plea of guilty before Judge Fesler of the District Court of Duluth, to a charge of practicing healing without a Basic Science Certificate. The defendant has persisted for the past three years in treating people in that vicinity for various ailments. He is not a medical man but apparently possessed some peculiar complex in reference to the practicing of healing. He had been previously warned on two occasions but continued to remain in the business. Mr. Brist, representing the State Board of Medical Examiners, reports finding various medicinal preparations, including chloroform and ether, in his possession, besides a stethoscope, thermometer, artery forceps and other surgical instruments.

Judge Fesler sentenced the defendant to pay a fine of $500 or three months on the St. Louis County Work Farm. The Court stayed the sentence until the further order of the Court. Judge Fesler warned Schmidt that any attempt on his part to practice healing in any way, shape or manner in the future would result in the payment of the fine and serving of the jail sentence. Schmidt has also been acting as Health Officer for three towns in that vicinity and receiving $450 a year for that service. He is to resign as Health Officer immediately.

Mr. Brist reports splendid coöperation from Mason M. Forbes, County Attorney of St. Louis County, and Harry Boyle, Assistant County Attorney. Splendid cooperation was also received from Judge Funck of the Municipal Court of Duluth and Judge Fesler of the District Court.

ARABIAN RHEUMATIC SPECIALIST SENTENCED TO WOMAN'S REFORMATORY AT SHAKOPEE, MINN.

State of Minnesota *vs.* Winchel

Ada Winchel, fifty-one years of age, was sentenced to a term of not to exceed one year in the Women's Reformatory at Shakopee, Minnesota, on December 8, 1930, by the Hon. R. D. O'Brien, Judge of the District Court, St. Paul, Minn. The defendant was arrested November 29, charged with a violation of the Basic Science Law. Mrs. Winchel has been maintaining an office at 308 Pittsburgh Bldg., St. Paul, without a license to practice healing. She held herself to the public as an Arabian Rheumatic Specialist. She was arrested following the diagnosis of a case as rheumatism and offering to cure the same in four months time. The defendant told the Court that she had been getting her Arabian liniment from Mohamet Nackley, alias "Doctor" Muckly, who on December 9, 1929, was sentenced to one year in the State Prison at Stillwater, Minnesota, for receiving the earnings of a prostitute. Nackley had his place of business at the Superior Hotel, 379 Jackson St., St. Paul. The Court suspended the sentence and placed Mrs. Winchel in the custody of the Probation Officer, on the condition that she close her office and refrain from practicing in any way, shape or manner in the State of Minnesota.

Splendid coöperation was received in this case from Dr. Simon, Health Officer, and Mr. C. D. O'Brien, Jr., County Attorney.

NATUROPATH IN PRACTICE FOURTEEN YEARS SENTENCED

State of Minnesota *vs.* Viger (two cases)

George R. Viger, 45 years of age, with offices at 400 Bremer Arcade, St. Paul, Minn., was sentenced by the Hon. R. D. O'Brien, Judge of the District Court, on December 10, to pay a fine of $200 and to serve a year in the Workhouse for practicing healing without a Basic Science Certificate. The fine was paid and the Court suspended the jail sentence on the condition that the defendant refrain from practicing healing in any manner in the State of Minnesota. It was stated to the Court that the defendant is leaving the State to enter the fruit business in Texas.

Viger was indicted by the Grand Jury of Ramsey County on November 26, on two counts charging him with practicing healing without a Basic Science certificate, in that he treated a patient for diabetes and another patient for goiter. The diabetes patient had been previously treated with insulin but had stopped taking insulin in April, 1930. The patient commenced treating with Viger in July, 1930. On September 21, the patient died at St. Cloud, Minn. The defendant has been engaged in the practice of healing in St. Paul for the past fourteen years. From 1920 to 1927 the defendant held himself to be a physician and surgeon. Recently he has been holding himself to be a naturopathic physician.

Mr. Brist, representing the State Board of Medical Examiners, reports splendid coöperation in this case from C. D. O'Brien, Jr., County Attorney, and Mr. Allen, Assistant County Attorney. Judge O'Brien is to be commended for his stand in insisting that unlicensed practitioners should not be allowed to continue in business and in placing over them a jail sentence of sufficient severity to make it unlikely that they will continue in business.

NATURE OF THE SUBSTANCE IN LIVER ACTIVE IN PERNICIOUS ANEMIA

The search for the "active principle" which renders liver potent in the treatment of pernicious anemia has resulted in the isolation of an active crystalline salt demonstrated to be clinically potent in pernicious anemia. It is a compound of beta-hydroxyglutamic acid and hydroxyproline. Both of these substances possess the characters of protein derivatives; the mode of their linkage remains to be ascertained. (Jour A. M. A., November 15, 1930, p. 1509.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

SPEAKER: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of February will be as follows:

February 4—Humidity in the Home.
February 11—Control of Diphtheria.
February 18—Treatment of Constipation.
February 25—Cancer of the Uterus.

SECRETARIES CONFERENCE

Among the important personages who will be present in St. Paul, Minnesota, for the annual Secretaries Conference at the St. Paul Hotel, February 7, are Drs. E. Starr Judd, Rochester, president-elect of the American Medical Association; L. Sogge, Windom, president of the Minnesota State Medical Association; and Messrs. H. A. Bellows, Minneapolis, vice president of the Columbia Broadcasting System, and Vernon D. Blank, Des Moines, Iowa, managing director of the Iowa State Medical Society.

Dr. E. Starr Judd, Dr. L. Sogge and Mr. H. A. Bellows will speak at the luncheon which is an annual feature of the meeting. Mr. Bellows has chosen for his subject, "The Use of Broadcasting for Misleading and Dangerous Advertising."

The morning session, opening at 9:00 o'clock, will be devoted largely to the interests and opportunities of the County Medical Society. Mr. Vernon D. Blank will explain the Iowa system of the "Care of the Indigent Sick by Contract." A symposium on "Public Health Relations" is to occupy the afternoon session.

CLAY-BECKER COUNTY SOCIETY

New officers of the Clay-Becker County Medical Society are: President, Dr. B. T. Bottolfson, Moorhead; vice president, Dr. J. E. Carman, Detroit Lakes; secretary-treasurer, Dr. J. H. Heimark, Moorhead; delegate, Dr. M. C. Bergheim, Hawley; alternate, Dr. O. O. Larsen, Detroit Lakes; censor, Dr. L. H. Rutledge, Detroit Lakes.

Dr. E. A. Meyerding and Dr. Robert M. Burns, St. Paul, Minnesota, addressed the annual meeting of the society on "Our Public Relations" and "The Trend of Modern Medicine," respectively, at the St. Ansgar's Hospital at Moorhead, Minnesota.

WASHINGTON COUNTY SOCIETY

The Washington County Medical Society met at the Stillwater Club Rooms for the regular monthly meeting, January 13, 1931, with a majority of the members present. Dr. J. B. Carey of the Nicollet Clinic, Minneapolis, was the guest speaker. His subject was "Gastrointestinal Lesions," the etiology, diagnosis and treatment, illustrated by numerous and very fine *x*-ray films.

CAMP RELEASE DISTRICT SOCIETY

Camp Release District Medical Society held its annual meeting in the Legion Hall, Granite Falls, Minn., December 4, 1930. During the business session the following officers were unanimously elected. Dr. J. S. Kilbride, Canby, president; Dr. F. W. Penhall, Morton, vice president; Dr. L. J. Holmberg, Canby, secretary-treasurer.

State Secretary E. A. Meyerding, of St. Paul, then gave a splendid talk on "How the State Association Coöperates with the Lay Organizations of the State," and presented lantern slides showing the new state association office building and the different departments.

Dr. W. A. Fansler, of Minneapolis, followed with an unusually interesting address on "Hemorrhoids and Their Treatment" and held a clinic, giving a practical demonstration of the injection method for ambulatory cases.

The society then adjourned to the Hotel Keegan for the joint banquet dinner with the Ladies' Auxiliary, during which our State President, Dr. S. H. Boyer of Duluth, addressed us in a very entertaining manner on "The General Activities of the Parent Organization."

Dr. Meyerding again spoke for the ladies, emphasizing the value of their organization to the district and state societies.

Meeting was again called to order in the Legion Hall, and Dr. T. A. Peppard, of Minneapolis, gave a most interesting and instructive talk on "Heart Diseases," held a heart clinic, and demonstrated the use of the electrocardiograph in a most practical manner. The Minneapolis General Electric Company had shipped the machine out to Granite Falls for this purpose.

A rising vote of thanks was tendered the distinguished guests for their presence and part in the program, and the meeting adjourned subject to executive call for the spring meeting.

L. J. Holmberg, *Secretary-Treasurer.*

ORAL USE OF OVARIAN PRODUCTS IN MENOPAUSE

Rational as ovarian therapy may theoretically appear to be in some conditions, the actual results are rarely striking and often nil to the careful observer. Extensive clinical experience has failed to establish the value of the desiccated preparations administered orally. The Council on Pharmacy and Chemistry has omitted all desiccated ovary preparations for oral administration because long extended clinical use has failed to demonstrate the efficacy of the marketed brands. (Jour. A. M. A., October 11, 1930, p. 1119.)

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. S. S. Hesselgrave, St. Paul
Chairman Press and Publicity—Mrs. E. A. Meyerding, St. Paul
Editor—Mrs. A. A. Passer, Olivia

The various committees of the Women's Auxiliary are at work with an earnest determination to obtain the most gratifying results each in their own particular sphere of action. Mrs. James Blake, chairman of the Organization and Membership Committee, assisted by the three vice presidents, has as an objective the organization of auxiliaries to twenty-four county medical societies and their affiliation to the State and to the National Auxiliaries. No county or other auxiliary may affiliate with the A. M. A. save through the state auxiliary; no auxiliary will be represented at the national convention that has not affiliated with our state auxiliary by March 15. The national fiscal year ends in March and no auxiliary is allowed a representative to the National Convention after the books are closed. If you have friends among the doctors' wives who are not members, tell them of the advantages of our organization, and ask them to join the 12,000 doctors' wives whose interests are closely linked with the medical profession. We must do our utmost to retain our rank of third largest membership in the national organization. Our membership now totals 838.

Mrs. Hugh J. Tunstead, legislative chairman, requests that each county appoint a member for her committee who may be called upon to perform only such service as shall be advised and approved by the Legislative Committee of the State Medical Association under the leadership of Dr. Herman Johnson. The National Auxiliary takes care of the legislation of interest to doctors, in the U. S. Senate and House, through the A. M. A., so our interest centers chiefly in legislation in our own state.

Mrs. Carl Larsen, chairman of the Finance and Budget Committee, is preparing the budget for the coming year.

Mrs. Ben Davis, chairman of Public Relations Committee, is awaiting the program now under consideration by our advisors. Dr. E. A. Meyerding, secretary of the Minnesota State Medical Association, has offered to loan books to auxiliaries for the study of medical subjects in preparation for intelligent discussion of various questions that are brought up at clubs, P. T. A., etc. He will also recommend speakers for meetings on application to him at 11 West Summit Avenue, St. Paul. HYGEIA and EVERYBODY'S HEALTH are recommended by our advisors, and should be placed in reading rooms, hospitals, schools and libraries. We trust that the offer of a double subscription to the above magazines made by the Minnesota Public Health Association in December will spread much truth in our state.

Mrs. E. A. Meyerding, chairman of Press and Publicity, asks that each county auxiliary publish notices of its meetings in the local papers; notices of all State Executive Board meetings, and of the annual meeting; three clippings to be sent to the editor, Mrs. A. A. Passer.

Mrs. A. A. Passer, editor, asks that news of auxiliary activities be sent her each month, not later than the eighth.

Mrs. S. S. Hesselgrave, president, sends the following message:

We have had the pleasure of visiting four of our auxiliaries, namely, Washington County, Rice County, Wright County, and Ramsey County, and during January we are to visit Hennepin and St. Louis Counties. We are impressed with the value of the auxiliary from many points of view. Especially is the spirit of kindliness evident in all these gatherings, and the oft repeated statement that doctors' wives, unlike doctors, have nothing in common, is truly an error, since the wives have one very decided interest and that is *the doctor*. Were the doctors to attend a meeting of any of the auxiliaries they would be convinced of the value of the auxiliary from the standpoint of the common interest of all its members.

The activities of our component societies are noteworthy. The hospitals and various institutions are the recipients of much cheer and comfort and our loans are a boon to the medical student and the student nurse.

The social side is not neglected and the well organized auxiliary can, with perfect ease, entertain hundreds of visitors during a convention, where the lack of an organization of that sort would entail a loss of time and prove a costly experiment. The very gracious hospitality extended by the St. Louis County Auxiliary to our members and to visitors during the annual convention in Duluth last July alone justifies the existence of a Women's Auxiliary.

A copy of the annual meeting minutes was sent to each county president in September, and a copy of the Constitution was mailed to each member of the state auxiliary in November. In December letters were sent to the county presidents asking them to coöperate in the sale of Christmas seals. Please notify us at once after your election of officers so that we may send material to the proper addresses.

At the request of the Women's Auxiliary to the A. M. A. we have asked that three advisors be appointed from the Minnesota State Medical Association, and we are informed that Drs. C. B. Wright, George Earl and E. A. Meyerding will guide us this coming year. May we suggest that local auxiliaries follow this plan? We cannot embarrass our medical societies in any way if we consult them first, and they know what they want their auxiliary to do and when to advise against imprudent actions.

May I solicit your coöperation and suggest that we put our best efforts into our work during the next four months, at the end of which time we must give an account of our stewardship to both the state and the national auxiliaries. The state meeting will be held in

Minneapolis May 3, 4 and 5, 1931, and the national convention will be held in Philadelphia June 8, 9, 10, 11 and 12, 1931.

BLUE EARTH COUNTY AUXILIARY

The Blue Earth County Auxiliary was organized in 1924 and affiliated with the State Auxiliary in 1926. It has a membership of nineteen. Two bridge teas were recently given, the proceeds to be used to sponsor "Hospital Day" at each of the local hospitals. The following officers were elected for 1931: President, Mrs. A. E. Sohner; vice president, Mrs. H. L. Huffington; secretary, Mrs. William Black; treasurer, Mrs. W. C. Stillwell; corresponding secretary, Mrs. John Butzer.

Committee chairmen for the year are: Legislative, Mrs. R. G. Hassett and Mrs. F. W. Franchere; Membership, Mrs. A. V. Denman, Mrs. J. T. Schlessleman; Press and Publicity, Mrs. John Butzer and Mrs. William Black; Social, Mrs. G. A. Dahl, Mrs. A. W. Eckstein and Mrs. A. J. Wentworth.

STEARNS-BENTON AUXILIARY

The Women's Auxiliary of the Stearns-Benton Medical Society has thirty-one state and local members. In December the members met with Mrs. Werner Hemstedt of the St. Cloud Reformatory, at which time a Hospital Auxiliary was organized for the purpose of making sheets and pillow cases for the St. Cloud hospital. The January meeting was held at the home of Mrs. J. E. Dwyer, St. Cloud. Officers for 1931 are: President, Mrs. Werner Hemstedt; first vice president, Mrs. T. N. Fleming; second vice president, Mrs. D. G. Kohler; corresponding secretary, Mrs. J. J. Gelz; recording secretary, Mrs. R. N. Jones; treasurer, Mrs. Jennie Hovorka; auditor, Mrs. J. C. Buscher.

WASHINGTON COUNTY AUXILIARY

On Tuesday, February 3, the Washington County Auxiliary and their husbands will be entertained at supper by Miss Christine Strom, superintendent of Lakeview Memorial Hospital, Stillwater. Speakers will be Drs. Herman Johnson, George Earl and Robert M. Burns.

The January meeting was held at the home of Mrs. E. Sydney Boleyn of Stillwater. Mrs. C. E. Andreassen of Minneapolis, who spent five years in China as the wife of a medical missionary, was the speaker.

Officers for 1931 are: President, Mrs. John W. Stuhr; vice president, Mrs. W. J. Hewson; secretary and treasurer, Mrs. Henry Van Meier.

HEXYLRESORCINOL AS AN ASCARICIDE

Lamson and his collaborators believe that they have discovered an effective ascaricide in hexylresorcinol. According to New and Non-official Remedies, the drug is stated to be relatively nontoxic when administered by mouth. The drug has irritant properties, but these are not regarded as a contraindication for its occasional use and they are transitory in effect. (Jour. A. M. A., November 22, 1930, p. 1592.)

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of December 10, 1930

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club, Wednesday evening, December 10, 1930. Dinner was served at 7 o'clock and the meeting was called to order by the President, Dr. Emil S. Geist. There were fifty-one members present.

Minutes of the November meeting were read by the Secretary and approved as read.

The following officers were elected for 1931: President, J. S. Gilfillan, St. Paul; vice president, J. C. Litzenberg, Minneapolis; secretary-treasurer, R. T. LaVake, Minneapolis.

The scientific program was as follows:

Dr. Hilding Berglund (Minneapolis) reported a case which had been seen at the University Hospital at various times over a period of three or four years, in which various diagnoses had been made.

DISCUSSION

Dr. E. L. Gardner (Minneapolis): This is an extremely interesting case. I have been following since the spring of 1927 a somewhat similar case. The patient is a nurse, forty years of age, who came into the office with the support of two friends. She had complained of stiffness of the muscles and joints, with various aches and pains which had been recurrent since 1917. In 1921 she began to have diarrhea with six or eight stools a day. She has been having recurrence of the diarrhea and stiffness throughout the body with the approach of spring each year, while in the fall and winter her symptoms were usually very slight. She had given no history of redness of the joints, has no fever and claims that the soreness was generally distributed not to the joints alone but all over the bony skeleton. She had noticed that there was free oil in the stools, which floated upon water. Her diet had always been an excessive vegetable one. She has become extremely irritable, some muscle twitching, and had been considered as a case of nervous prostration.

Upon examination we found a very frail young woman, under ninety pounds in weight. The skin was rather pale, muscles flabby, gait very difficult because of an extreme spasm of the spinal muscles and upper thigh muscles, especially the adductors of the thigh, whenever she attempted to walk. The positive findings were spongy gums with soft teeth, negative chest, and upon examination of the extremities there seemed to be an intense tenderness over the bones upon pressure and not limited to the joints. The muscles were extremely spastic and irritable, although we could not demonstrate any of the symptoms of true tetany. The abdomen showed general tenderness, especially over the colon. The nervous examination was entirely negative. There was no decrease of vibration sense. There was a complete achylia gastrica. The hemoglobin ranged between 50 and 65 per cent but there was no abnormal condition of the red blood cells except hypochromasia.

and the hemoglobin index was well below one. There were no changes in the blood to suggest pernicious anemia. The stools were strongly acid in reaction, of waxy color and contained a large quantity of neutral fat which stained with fat stain. There was also a marked excess of undigested meat fibers and starch granules. The blood chemistry showed a calcium of 8.8, but a normal VanSlyke. The *x*-ray examination showed a normal stomach except for hyperperistalsis and there was hypermotility all along the digestive tract. The gallbladder filled poorly after tetraiodophthalein. One very important feature of the case was that it was almost impossible to show the bone on *x*-ray films because of the lack of shadow-producing quality, which was interpreted as probably due to a withdrawal of calcium phosphate.

The progress of this case was extremely interesting. Since we were unable to make a definite diagnosis as to the condition, but since we believed that many of the symptoms were not due to arthritis but due to decalcification of the bone, and since the patient apparently was losing so much calcium by the diarrhea, we put her on a diet which would produce the nearest normal stools. She was given a diet with restriction of starches, but containing rather large quantities of butter-fat. All the vegetables were finely divided and she was given rather large quantities of protein. She was also given large doses of calcium carbonate and calcium phosphate sufficient to hold down the diarrhea. Under this management, as well as the exposure to sunlight, the stools became formed and free from undigested food particles. Within six months after treatment the patient was able to be up and about and during the past three years has been able to be a public health nurse in one of our largest department stores. She has had no recurrence of her trouble, but is still very careful to maintain normally formed stools as well as maintain her nutrition.

An *x*-ray examination of the bones more recently shows them to be perfectly normal. There was no arthritis and no deformities.

This case also seems to be one of decalcification of the bone, probably secondary to a gastrointestinal lesion which prevented the proper absorption of calcium salts and caused their withdrawal from the bony skeleton. We have in this case a blood calcium slightly below normal which returned to normal after a period of three months. And also we had in this case a muscle irritability and muscle spasm. The VanSlyke was always normal and we could not demonstrate a true spasmophilia.

Both Dr. Berglund's and my case are interesting for speculation, but it seems very probable that the withdrawal of calcium from the body by a chronic diarrhea was an important factor in producing the symptoms.

Dr. James Johnson (Minneapolis) read his thesis, entitled "Acute Mechanical Obstruction of the Lower Bowel, with an Analysis of Thirty-six Personal Cases." Lantern slides were shown.

DISCUSSION

Dr. A. R. Colvin (St. Paul): I am not quite clear as to Dr. Johnson's classification of high and low obstruction. Of course, we all readily recognize the fact that the higher up in the small intestine the obstruction occurs the more dangerous it is. The classification that I like to carry in mind is whether the obstruction is of the large bowel or of the small bowel.

An English surgeon reported all the cases operated on at one of the large London hospitals—over 900 cases. His study led him to believe that it was almost fatal to attempt to do any radical surgery in acute obstruction. Enterostomy, of course, as Dr. Johnson has done it, is a life-saving procedure. In obstruction of the colon from the cecum on, I believe the life-saving procedure is cecostomy. It is sometimes a question as to how cecostomy or enterostomy should be done.

The cecum seems to bear the brunt of the distention; obstruction anywhere below the cecum is attended by greater distention of the cecum than any other part of the large bowel. Indeed, in a neglected case we may find ulcers in the cecum without finding ulcers anywhere else. I think if the cecum is very greatly distended and the patient is very sick, even a little nick made to put a catheter in may allow just enough contents to escape to spoil the whole game and the patient may die of peritonitis.

The procedure I like best is, under local anesthesia, to expose the cecum so that a sufficient area can be used to suture to the peritoneum. If not sewed to anything more than the peritoneum, the opening will almost invariably close. It is difficult to sew this without penetrating the distended cecum, but it can be done and in that manner one can wall off a portion of the cecum enough to definitely relieve the obstruction. It is very rare, of course, that one can't wait a few hours before opening the cecum. It is best to wait 4 or 5 hours if possible, because it is surprising how much gluing of the peritoneum has occurred and there is no danger then of infecting the peritoneal cavity. The relief on opening is almost immediate. It is fatal to try to do a resection in acute obstruction.

The diagnosis of intestinal obstruction in the large bowel is a very interesting subject. For instance, I saw a woman about a year ago who was brought into the hospital with a very high temperature and in a great deal of pain. Her symptoms were those of obstruction existing only a few hours. It is very rare to have an elevation of temperature in early obstruction. However, on giving barium, an obstruction was found in the region of the splenic flexure. Cecostomy was done at once and the patient relieved. On account of the location of the obstruction it was thought that it was due to carcinoma. After relieving these patients by cecostomy, there is no hurry for further operative procedures. A few weeks do not mean much compared to the safety of the patient insured by giving the bowel time to recover its tone. Later on, in this woman's case there was found to be a carcinoma of the splenic flexure and the temperature, I believe, was due to an infected carcinoma. I believe this is comparatively common in carcinoma of the colon. In carcinoma of the colon the supervening obstruction is often due to an inflammatory thickening superimposed upon the carcinomatous region. After the relief of the obstruction, it takes quite a while for this edema to subside, but it frequently does. In this particular case the conditions were interesting because about a week after I had done the cecostomy she complained one day of a good deal of pressing down pain in the rectum. I had examined her digitally after relieving her by cecostomy and the rectum was empty, but later, at the time of the complaint of rectal pain, I found that she had a fecal impaction in the rectum. Following the cecostomy the relief of the edema had been sufficient for the feces to travel through the carcinomatous mass and fecal impaction occurred. Undoubtedly in these narrow strictures due to carcinoma the liquid content of the upper colon can seep through the stricture and, becoming inspissated lower down, become well-formed masses.

Dr. A. T. Mann (Minneapolis): I want to compliment the essayist on the very fine way in which he has handled this subject and given us his observations. I notice in the list of his chemical changes of the blood, that he has acidosis down. It seems to me that in nearly all the cases in which vomiting has occurred to an extent to produce chemical changes, we have an alkalosis, which is a much more dangerous thing than acidosis itself. We have, with these changes, the kidney changes shown very definitely in the blood chemistry by a high urea content and often by albumin and casts. So that we have two or three different things to consider in deciding on the treatment for an intestinal obstruction: there is the obstruction itself, and what we shall do for the toxemia, the dehydration, the alkalosis and high urea percentage. The sodium chloride in the water has seemed to have a marvelous effect in straightening out these conditions. It helps the dehydration of course, and it has a very marked effect on the alkalosis.

It is more of a problem just what the glucose does and, as nearly as I can get at it, its effect on the kidney itself is to help the kidney straighten out by its diuretic effect, because if we have an alkalosis it is not logical to put in sugar for the alkalosis itself, so it certainly must do something else, and its effect on the kidney in helping it to do its work better may explain some of its value.

In the operative field, in the late cases we must be very careful about limiting the extent of surgery as much as possible. Enterostomy should be employed more than it is and, in the later cases, very often nothing else should be done. Holden not only does that in practically every case, but he disembowels the patient and with the aid of an assistant he actually strips the bowel, from the top down, between his fingers, which he first smears with vaseline. But that never seems to me quite a proper surgical procedure on account of the shock. We know that the handling of the bowel is one of the things which causes shock in a most marked degree so that I believe that surgeons in general do not think it is best to do it.

I think the essayist is greatly to be congratulated on his work.

Dr. A. E. Benjamin (Minneapolis): I have been very much interested in this paper. It seems to me the first thing one should do is to make a diagnosis of where the obstruction is and what the causes are. We know that if the obstruction is in the small bowel the treatment is different than when in the lower bowel. If due to bands of adhesions in the ascending colon, a right-sided incision (as in appendicitis) relieving the obstruction is all that is required. If the obstruction is in the descending colon or sigmoid due to diverticulitis, the treatment must necessarily be different. When due to diverticulitis or carcinoma of the sigmoid or colon, a colostomy may be necessary. In certain forms of diverticulitis producing acute obstruction a colostomy may be done by simply bringing the colon up through the abdominal incision, passing a fascial strip through the mesentery for support and when the inflammatory obstruction subsides this strip may be cut and the colon replaced in the abdomen. The colostomy will narrow as the colon functions or it may be closed by an operation.

If there is much vomiting, a gastric lavage should be performed at frequent intervals to remove the toxic substances. When the bowel is distended from gas and contents, there is a transmigration of infectious microorganisms through the walls of the intestines and a peritonitis may supervene. The gastric lavage reduces the distention and the patient may be relieved of the obstruction. Regurgitation of infectious material in the bowel to a higher level which the upper intestinal tract is not used to harboring may be responsible for a toxic state. In case of a distended cecum, I prefer to use a hypodermic needle of large caliber to empty the colon of the gaseous material, when the bowel may be brought up into the wound and a cecostomy more easily performed. Washing the bowel out at frequent intervals through a colostomy opening reduces the toxic substances and overcomes the distention. It also prevents dehydration.

If we can make the diagnosis in the first place our incision can be made with more certainty of overcoming the condition. Resection, of course, should be performed only in old chronic small carcinoma, simple obstructive cases or acute mesenteric thrombosis.

Dr. Johnson (in closing): I wish to thank all of the doctors who took part in the discussion of this thesis.

Dr. Colvin's question in regard to the classification of high and low obstruction is undoubtedly well put. The obstructions reported here are all in the lower ileum and colon. High obstructions would be considered those in the pylorus, duodenum and jejunum. I do not know that one can draw an arbitrary line as to what would be high and what would be low except from a general understanding. Dr. Colvin and Dr. Mann both mention cecostomy in the presence of obstruction from malignancy in the colon. The cases reported here causing obstruction were all in the descending colon where they could be brought out and a tube put in the proximal loop. However, as a general rule, it is very necessary before ever attempting a resection of a malignancy in the colon to do a primary cecostomy and allow the patient to overcome all of the symptoms of an acute obstruction before attempting the major procedure.

The blood chemical changes in the reported cases have, I believe, almost entirely been alkalosis. In fact, it is very rare now that one ever sees any marked chemical changes of either alkalosis or acidosis, because they occur only in neglected cases. Dr. Mann mentions the danger of stripping the bowel in cases of obstruction. There are some cases in which this can be done to great advantage, but it should be done with a great deal of care. In other cases, where the bowel is very friable and where undoubtedly leakage has occurred, it is no doubt advisable not to do this procedure. I believe this should be left, like many other things, to the individual judgment of the surgeon.

Owing to the lateness of the hour, Dr. F. E. Burch, who was to give a paper on "The Operative Treatment of Squint by Tucking Method," asked that this be postponed to some future meeting.

The meeting adjourned.

R. T. LaVake, M.D., *Secretary.*

(Continued from page 182)

45 years of age. In May, 1928, she had a breast amputation for cancer. In November, 1928, she was in an auto accident. After getting out of the wreck, she was able to walk down the road about two blocks, but has never been able to walk since. The right leg has shortened about 3 inches. Following the accident she has been confined to bed, lost weight, been unable to eat, has pain in her sacral region, in right hip and leg and in left iliac crest. She has a mass in the left epigastric region the size of an orange that is fairly firm and irregular in outline. I saw her first in April, 1930. At that time she was taking morphine gr. ½ every 3-4 hours, was very emaciated and anemic, was vomiting. I expected her to die within a few weeks. I did not see her again until July 18th. She has gained weight, is eating well, is taking morphine only twice a day, says she feels good except for considerable pain in her sacrum. She tells me that since April she has been taking 3 drams of whiskey three or four times a day and she attributes her improvement to that. The *x*-ray shows a fracture neck of the femur and carcinoma. Some one has told her that her trouble is tuberculosis of the bone and that the prognosis is not fatal and that she ought to recover.

Answer.—The moth-eaten appearance is diagnostic of metastatic tumor from the breast. The change in the left hip suggests either an old fracture or more likely a purulent arthritis with destruction of the head of the bone and part of the acetabulum. There is nothing about the case which suggests tuberculosis. We have found that the treatment of metastatic tumor of the bone very often should be given in this order: Deep *x*-ray first, and if this does not succeed, follow with morphine. We have had some very startling results with prompt and temporary relief of pain by deep *x*-ray treatment. It might be possible, if the patient's condition warrants it, to try the effect of this treatment if she still complains of pain. Morphine should be the treatment of last, not first resort.

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of December 4, 1930

The regular monthly scientific meeting of the Minneapolis Surgical Society was held in the lounge of the Hennepin County Medical Society in the Medical Arts Building on Thursday evening, December 4, 1930, at 8 o'clock.

The meeting was called to order by the vice president, Dr. Theodore Sweetser, in the absence of the president. There were twenty-eight members and three visitors present.

Minutes of the November meeting were omitted on account of the length of the program of the evening.

The scientific program was at once taken up and consisted of the following:

Dr. Verne S. Cabot reported two cases as follows:

1. A Case of Splenomegaly with Anemia Complicated by Pregnancy. The patient was a young woman twenty-nine years old whose history prior to her twenty-third year was essentially normal. She was married at twenty-three years of age. The same year she submitted to an appendectomy. At twenty-four years she had a severe facial erysipelas which left her without apparent sequelæ.

During her first pregnancy, in her twenty-fifth year, she became very weak and pale. At this time she was suffering with a right-sided pyelitis, and because of this and her poor general condition she was sent to the hospital in her sixth month of gestation. Her pyelitis cleared up promptly. Early in her hospital stay she was found to have an enlarged spleen and liver, together with a marked anemia. She remained in the hospital because of her marked weakness and gastrointestinal upsets until her seventh month of gestation, when she developed a pneumonia during which she became jaundiced, causing a termination of her pregnancy at seven and one-half months.

Her hospital stay totaled twenty-six weeks. The jaundice persisted for two months, at which time she was discharged from the hospital at her insistence. She was told that despite the disappearance of her jaundice she was still anemic and that there had been little, if any, change in her splenic and hepatic enlargements.

Her condition for the next year and a half was one of improvement. There was no recurrence of her jaundice and she was told that her anemia was improving, though she still had a large spleen with a palpable liver. At this time she became pregnant, with a recurrence of her previous symptoms, terminating in an inevitable abortion at three months. There was no jaundice during this second pregnancy. Her convalescence was very slow, several months elapsing before she was up and about.

This young woman came under our observation at this time (1928). She was then in her twenty-seventh year. She was apparently suffering a recurrence of her previous symptoms, namely, prostrating weakness, gastro-intestinal upsets associated with loss of color. She told us that her present exacerbation of symptoms appeared three months previous, and that she attributed this recurrence to a third pregnancy likewise of three months' duration.

Examination revealed the patient to be a pale, listless individual, slightly jaundiced, and with evidence of recent weight loss. She stated that she had lost 23 pounds in the last three months. Physical examination revealed an upper-left-quadrant abdominal mass, probably spleen, extending downward to the level of the umbilicus and medially to the midline. The splenic notch was palpable. The liver margin was a finger's breadth below the right costal margin. There was no demonstrable ascites. There was a uterine enlargement suggestive of a three months' gestation.

Roentgen studies revealed no abnormality of the chest. *X*-ray studies of the abdominal viscera visualized a large mass in the upper left quadrant. No biliary calculi were seen. Her barium motor meals were essentially normal except for displacement of viscera by the splenic mass.

Her temperature readings were practically normal at all times. Laboratory findings, in brief, were: urine normal, contains no bile; Hb. 55 per cent, r.b.c. 4,430,000, w.b.c. 4,800. Differential cell counts were essentially normal. Blood smears were apparently normal beyond a slight tendency toward vacuolization. The clotting time was 4.25 minutes. Fragility tests showed initial hemolysis at .44 and complete at .33. The blood Wassermann was negative.

In view of the findings a diagnosis of splenomegaly with anemia complicated by pregnancy was rendered, and, in consideration of her previous experiences, removal of her spleen was recommended.

Laparotomy was done in June, 1928. A large spleen was found filling the left diaphragmatic dome and extending downward to the umbilical level and medially to near the midline. The liver was only slightly enlarged, with very little evidence macroscopically of gross changes. The gallbladder was large, grayish in color and thick-walled, with no palpable calculi in the biliary tract. A splenectomy and cholecystectomy were done.

Her postoperative convalescence was uneventful. She was discharged from the hospital on her fourteenth postoperative day. The pathologist reported a large spleen retaining its original shape, sections of which showed a diffuse hyperplasia with fibrosis of both pulp and corpuscles. Histologically it was a splenomegaly of the Banti type. The gallbladder showed a much thickened wall. Diagnosis: chronic cholecystitis.

As to her subsequent history, her pregnancy was uninterrupted, going to full term, and she was delivered of a viable child which, to date, is apparently normal. We have watched her progress relatively close. She is without complaint, her weight is back to normal and she is able to do her housework. Recent laboratory studies show a normal urine, the hemoglobin averages 75 per cent, cellular counts are within normal ranges, as is the fragility test.

There is no history obtainable of similar afflictions in her family tree. (The patient was presented before the Society.)

2. A Case of Hemolytic Icterus Complicated by Extensive Healed X-ray Burns Over the Splenic Area.

This patient was first seen by Dr. Cabot in 1926, at which time she was twenty-four years of age and unmarried. Her history revealed that she had been jaundiced from birth; the jaundice varied as to degree of intensity, but at no time was she entirely free. Associated with her jaundice was extreme lassitude, at times so severe as to completely invalid her. She had been under medical supervision since birth, being treated principally for her anemia, the medication including extensive and repeated hospitalization periods, at which times she received numerous blood transfusions. There was no history in her family tree of others similarly afflicted.

Early in her childhood a mass was palpable in the upper left abdominal quadrant. This mass had gradually grown in size to date. The predominant symptoms throughout had been weakness, pallor, and a persistent jaundice. At the age of eighteen she first noticed a chain of gastrointestinal symptoms consisting of abdominal bloating, aversion to fat, increased constipation, and symptoms suggestive of gallstone colic associated with dark urine and clay colored stools.

At the age of twenty-two she suffered a third degree *x*-ray burn over the region of the spleen and the lower portion of the left breast. This was the result of improper roentgen therapy for her apparent splenomegaly. She stated that she had received but one massive treatment, the burn showing up on the sixth day following. It was at this time that she came under Dr. Cabot's observation seeking relief primarily from this extensive *x*-ray burn. She was immediately hospitalized, receiving repeated blood transfusions in addition to local treatment for the burn. Fourteen months elapsed before the burned area was completely healed. Following this the patient presented herself for relief from her abdominal discomfort and persistent jaundice. The icterus was severe enough to cause intense itching.

The physical examination was essentially normal beyond the abdominal findings, consisting of a massive healed scarred area over the upper left abdominal quadrant and a smaller area involving the lowest pendulous portion of the left breast. There was a large intra-abdominal mass in the upper left abdominal quadrant, the upper portion of which could not be made out. At various examinations the lower pole extended to the upper border of the left iliac crest and medially to the midline. The splenic notch could not be demonstrated. The mass was apparently fixed.

Roentgen studies of her chest revealed no abnormalities. Gastro-intestinal studies revealed a lamellar calculus in the gallbladder and the presence of a large mass in the splenic area. The findings from the numerous motor meals were normal beyond a displacement due to the large splenic tumor. Her hemoglobin averaged 50 per cent, ranging from 15 to 55 per cent; r.b.c. 4,000,000, w.b.c. 6,000. Differential count was normal. Blood smears showed many microcytes and some pessary forms. The clotting time was 3.5 minutes. The blood Wassermann was negative. The fragility test showed hemolysis starting at .49 and complete at .41. Urinalyses were normal except for the presence of bile, which was found at repeated examinations. Gastric analyses showed free acid within normal ranges.

The problem of surgical relief in this patient was complicated by the presence of this extensive scarring from the *x*-ray burn, with unknown involvement of the underlying tissues. The question arose as to the degree of fixation resultant from the overly-intensive roentgen therapy. In addition, the presence of biliary calculi, which were causing severe gastro-intestinal upsets, further complicated the picture. It was the preoperative opinion of both Drs. Bell and O'Brien that the splenic condition was of greater importance and should be dealt with first; also, that the apparent fixation of the mass was probably little influenced by the severe radiation. This was borne out at the operating table.

The patient submitted to operation in November, 1927, at which time an enormous spleen was found filling the upper left abdominal quadrant and extending downward to the upper border of the left iliac crest and medially to the midline. There were numerous relatively fine adhesions between the spleen and the left diaphragm. Whether or not these were the result of the intensive radiation is conjectural. The liver was slightly enlarged with rounded edges. The gallbladder was thick-walled, containing one large calculus which had been visualized preoperatively, and numerous smaller calculi. A splenectomy and cholecystectomy were done, at the termination of which a direct blood transfusion was given.

The postoperative convalescence was uneventful. By the fifth day the jaundice had disappeared for the first time in her life. The wound healing was apparently normal. She was discharged from the hospital on the nineteenth postoperative day.

The Department of Pathology at the University reported a spleen of approximately 2,800 grams, showing very marked pulp congestion with extremely small and relatively infrequent sinuses. This is probably the most typical histologic picture in congenital hemolytic jaundice. Sections of this spleen were shown by Dr. Cecil J. Watson at a subsequent meeting of the Pathological Society at which the histologic changes in this disease were discussed.

Three years have now elapsed since the operative procedures above described. The young lady has enjoyed apparently normal health to date. Recent laboratory studies show a bile-free urine, hemoglobin of 80 to 85 per cent, and cellular studies of the blood are apparently normal. Her fragility tests are still slightly increased, hemolysis starting at .44 and being completed at .42.

(The patient was presented before the Society.)

DISCUSSION

Dr. E. A. Regnier asked as to the condition of the liver in the first case.

Dr. Cabot said there were not many changes and microscopically there was very little change. The liver was palpable. Neither of these patients had ascitic fluid.

Dr. Ivar Sivertsen said he wished to compliment Dr. Cabot on these cases and reporting them to the Society. The question of the spleen has always been of interest, having been recognized by the ancients, even as far back as Aristotle, who had noticed that the spleen might be congenitally absent; and a sect of surgeons in 1700 made quite a reputation for themselves by removing the spleen. It was in 1885 that Drs. Simon and Haeckle of Darmstadt, Germany, were especially interested in the question of the spleen and splenectomy and at that time it was argued that there was no reason for the removal of the spleen, and the Surgical Society of Hesse decided it should be done only for injury. Collier, in 1882, compiled studies of the spleen and concluded that the operation of splenectomy could be justified in cases of splenoptosis, cysts and idiopathic enlargements of the spleen. Mayo and others have worked on the spleen and have found that it could be removed for splenic anemia, hemolytic jaundice, Gaucher's disease, and selected types of early pernicious anemia.

Dr. Sivertsen thought this case of Dr. Cabot's was probably one of splenic anemia so that it came within the range of removal. He said the question of operative procedure had always interested him and he noted that Dr. Cabot had used the median incision. Dr. Sivertsen believed that making a transverse incision, cutting across the left rectus muscle and going over to the right rectus muscle, greatly facilitated the removal of the spleen. He said it was very important that adhesions be clamped and tied before liberation of the spleen was attempted, after having first ligated the splenophrenic ligament. Then the question of dealing with the pedicle of the spleen was also of interest to Dr. Sivertsen. It is very friable and must not be handled roughly for it has happened that the spleen has been torn away in this way. Dr. Sivertsen said there was one thing Dr. Cabot had not brought out and which he felt was worth while, and that was hemorrhage following splenectomy; and that one might still have a very severe hemorrhage from some of the mucous membranes of the body after such an operation, even after a few hours or as long as seven years after.

Dr. Sivertsen wished to thank Dr. Cabot again for bringing these cases before the Society.

Dr. Rishmiller asked as to where these hemorrhages might occur.

Dr. Sivertsen said they might come from the mouth, uterus, or any of the mucous membranes.

Dr. Theodore Sweetser remarked that it might be encouraging to recall the case of severe third degree Banti's disease with ascites reported by Dr. H. B. Sweetser, Sr., in 1920. Clinically the patient has remained well, according to their latest word, even quite recently, though the blood picture has never become entirely normal. A splenectomy, even when done late, may effect a clinical cure.

Dr. Thomas J. Kinsella reported a case of Retrograde Intussusception of the Jejunum through a Gastroenterostomy Stoma observed on the Surgical Service at Glen Lake Sanatorium in September, 1930.

The patient, a woman forty years of age, suffering from an advanced pulmonary tuberculosis, had apparently carried the condition and been totally obstructed for three days before the surgical consultation. The posterior gastrojejunostomy through which the intussusception occurred had been done some five years previously for a duodenal ulcer and apparently had functioned perfectly until this complication arose. At operation the stomach was found filled with the intussuscepted jejunum, which was gangrenous and irreducible. Resection was not attempted because of the patient's critical condition. Death occurred twenty-four hours later.

The complete specimen obtained at postmortem was presented.

The case report, which included a review of the twenty-seven somewhat similar cases collected from the literature, was illustrated by a series of lantern slides showing the various types of conditions encountered.

DISCUSSION

Dr. Verne S. Cabot said he wished to compliment Dr. Kinsella upon this detailed report of so interesting a case. The essayist had called attention to the difficulties of accurate preoperative diagnosis, as these patients are usually seen late in their acute phase of the obstruction.

Dr. Cabot said he wished to report a similar case that had come under their care in 1926. The patient, a young man of twenty-six years of age with a history of duodenal ulcer, had submitted to a transmesocolic gastrojejunostomy in 1922 at an Army Hospital. He was much improved for several years following the operation, when he began again to have indigestion with upper abdominal discomfort, terminating in obstruction similar to the case just described by Dr. Kinsella.

They first saw this patient seventy-two hours after the onset of symptoms, at which time he was lying in the hospital in a semi-comatose condition with a markedly distended abdomen. From relatives they had learned the above history. He was markedly dehydrated and was vomiting periodically, the emesis appearing fecal in character. He was given forced fluids by all avenues, as well as repeated gastric lavage, and a few hours later a laparotomy was done at which a complete obstruction of the gastrojejunal stoma was found due to the angulation and intussusception of the distal arm of the transmesocolic gastrojejunostomy anastomosis into the stoma. The reverse peristalsis in the distal arm emptied contents into the stomach, but none could pass outward due to the trap effect of the intussusception of the jejunum through the stoma. The proximal arm of anastomosis was 5 inches in diameter and markedly indurated due to continued pressure and irritation. Fortunately the intussusception was reducible. An entero-anastomosis of the afferent and efferent loops was done. In addition, the efferent loop immediately adjacent to the stoma was lightly stitched to the gastric wall to further prevent a recurrence of the intussusception.

The patient's postoperative period was very stormy for the first few days, during which he suffered a double parotitis. He was discharged from the hospital on his twenty-first postoperative day. They had watched this young man to date and at intervals had subjected him to gastro-intestinal examinations which show normal functioning of short-circuiting mechanism. He has remained symptom-free.

In the absence of Dr. A. L. Herman, who was to have read his thesis at this meeting, an informal discussion was held on gunshot wounds of the abdomen and the following cases were reported:

1. Dr. R. R. Cranmer reported the case of the bandit recently shot in a restaurant holdup, who received five bullet wounds. One penetrated the scalp without entering the skull, and two passed through the left arm. There was another gunshot wound in the lower left quadrant which penetrated the small bowel three times. The bullet penetrated the mesentery of the sigmoid and lodged in the left iliac fossa. It must have penetrated the bowel on both sides at one point and then just grazed the wall at another point, as there were only three holes. These three holes were all within a distance of two inches of each other. Then he had another one which entered just below the spleen on the left side and took an upward course into the left chest, evidently not hitting any blood vessels. He has not vomited blood and there has been no blood in the urine, but at operation he had quite a lot of blood in the peritoneal cavity. At operation three cigarette drains were inserted through the incision, also another drain through the opening where the second bullet entered the abdomen.

Dr. Cranmer stated that so far the patient had been getting along all right; in fact, better than it was first thought he would.

2. Dr. Theodore Sweetser remembered two peculiar bullet wounds. The first was in a negro who was admitted to the Minneapolis General Hospital after having been shot in the left hip. Roentgenogram showed the bullet in the pelvis to the right of the midline, but before it could be further localized he voided a large quantity of bloody urine, and with it the bullet. Operation showed that the bullet, without entering the peritoneal cavity, had torn off the lower end of the left ureter, entered the bladder just medial to the left ureteral orifice, penetrated the right wall of the bladder farther forward, and finally had fallen back into the bladder and been voided with the urine.

The second case was seen at autopsy at a base hospital in France during the war. The man had been shot in the right flank. During operation for extraction of the bullet, the bullet had disappeared. From the noises heard over the precordium, it was evident that the bullet had been dislodged into the hepatic vein and had found its way to the heart. After apparently doing well for a week or ten days, the man suffered an evident pulmonary embolism and the noises over the precordium ceased. When he was apparently recovering from his injuries, he acquired diphtheria from another patient and died from the diphtheria. At autopsy a recent pulmonary infarct was found, with the bullet plugging the corresponding fairly large branch of the pulmonary artery.

3. Dr. R. F. McGandy reported the case of a girl who had shot herself on account of a love affair. The bullet, 32 caliber, entered her abdomen in the midline just below the xiphoid process and in its course through the abdomen penetrated the left lobe of the liver, the stomach and the left kidney. The patient was transfused immediately upon her arrival at the hospital. She was given a general anesthetic, after which clear blood was removed from the bladder by means of a catheter. An upper left rectus incision was made. The outer third of the left lobe of the liver was practically amputated by the injury. The liver defect was repaired. The stomach, both front and back, was closed in the usual manner. A large amount of free blood was found, not only in the abdominal cavity but also in the lesser peritoneal cavity. Because of the patient's condition nothing was done to the kidney at this time.

The significant thing in this case was the large number of complications following this gunshot wound. The patient first developed a pneumonia, which resolved in due time, leaving a pleurisy with a small amount of fluid in the left chest. On the tenth day she developed a marked adenitis on the left side of her neck which subsided upon the application of cold packs. Shortly following this she had a severe diarrhea, having ten to twelve stools for two days. This was closely followed by a pyelitis. She was discharged from the hospital seven weeks following the operation.

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

THE FRANK W. FRIEND FRAUD

Under the trade name "Frank W. Friend," Mrs. N. F. Lockwood of Littleton, Colorado, has been selling through the mails a so-called Wonder Remedy for Men. The alleged wonder was composed largely of extract of saw palmetto berries and, according to the postal official's report, was obtained from Parke, Davis and Co. Mrs. Lockwood started the business about November, 1928. She claims to have had the assistance of her brother, Frank L. Palmer, who has been associated with similar ventures, in preparing the advertising matter. According to the postoffice authorities Mrs. Lockwood got two dollars a box for one hundred pills which cost her seven and a half cents from Parke, Davis and Co. On June 30 the Postmaster General debarred the Frank W. Friend fraud from the mails. (Jour. A. M. A., July 26, 1930, p. 285.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg.
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

MANAGEMENT OF OTITIS MEDIA IN CHILDREN: Dr. Edmund Prince Fowler (The Laryngoscope, Vol. XL, October, 1930). This article is certainly a very sound and comprehensive view of the subject title. The author first states that, after all, the removal of the cause is the best treatment of disease (an old and time-worn axiom, but nevertheless one frequently temporarily forgotten). He divides his approach to the problem into four subdivisions: 1. Elevation and cure of the infection. 2. Prevention of complications. 3. Restoration and preservation of the hearing. 4. Prophylaxis for the opposite ear and for recurrence of the inflammation.

These objectives are all obtained by adequate drainage through the eustachian tube, and spontaneous rupture of the drum or its incision. Simple mastoidectomy is the conservative procedure when the child still shows or begins to show increasing signs of sepsis or complications. Non-suppurative and suppurative otitis media often occur in children without pain or manifest distress or discharge. The most perfectly treated ear infections may go on to mastoiditis, sinus thrombosis, and meningitis, and the most negligent speedily recover with perfect hearing. The author severely condemns too much operating by otolaryngologists in the early stages with subsequent reactions. The tendency of the otolaryngologists is to exaggerate the danger of middle ear disease and mastoiditis and to rush patients into operations. Excluding trauma, abscess in the ear has its etiology in the naso-pharyngeal spaces. The ear is but one of the nasal sinuses and should be so treated. Failure to conquer the disease in the naso-pharyngeal spaces is the outstanding crime in otological practice today.

Treatment of the nose and its sinuses is of prime importance in the obtaining of the four main objectives outlined. The author demonstrates by roentgenogram that 86 per cent of his cases of transitory, chronic, or progressive deafness are intimately associated with disease of the sinuses.

Experimental work has given considerable evidence that deficiency in Vitamins A and D and calcium phosphorus imbalance are associated with middle ear and sinus infections. These factors were given careful study in all of the author's cases. Each patient received in addition to a careful otologic examination, audiometer tests, stereoscopic roentgenograms, blood chemistry, Wassermann, and intercutaneous T. B. tests; also careful inquiry into nutritional disorders and the diseases of childhood.

L. C. C.

IMPORTANT POINTS IN TONSILLECTOMY: A. M. Painter, Kansas City, Mo. (Annals of Otol., Rhinol. and Laryngol., Vol. XXXIX, Sept. 3, 1930). This worthwhile article is mainly a strong plea for *complete* removal of tonsil and *capsule;* together with a description of technic which would seem to be "foolproof."

Attention is called to the high percentage of tonsillar remnants remaining after tonsillectomy. Invariably, these are infected and sealed in. The patient is therefore in a more dangerous condition from the angle of "focal infection" than before operation. These results (73 per cent) are usually due to unremoved bits of tonsil (and, or) capsule, which have the power of reproduction to an amazing degree.

A clear description of the tonsillar capsule and pharyngeal aponeurosis is then given, with especial reference to the plica triangularis. This latter should be considered as a part of the capsule (not of the anterior pillar), and its complete removal is imperative to insure a throat free from infected tissue, and a decent cosmetic result.

An unobstructed view must be had throughout the operation; the sense of touch cannot be depended upon.

Anesthesia is important, and a clear description of the author's given. Particular attention is given to dissection along the post-pillar (a step usually omitted by many surgeons). Incisions are made through the mucosa with a very sharp knife to avoid tearing the membrane. The incision along the anterior border of the anterior pillar is very important, as it should entirely free the plica triangularis from the anterior pillar, leaving it attached to the tonsil. The anterior and posterior incisions are joined above the tonsil by severing the mucous membrane between their upper extremeties. Dissection is started from below upward, where tongue and anterior pillar join, line of cleavage located, and dissection continued backward and upward. Vessels are clamped before being cut. The upper pole is freed and dissection carried down the posterior pillar to the base. Usually the gland is completely freed by dissection, but often a snare is used at the base or "root" of the tonsil.

M. W. Wheeler, M.D.

BRAIN ABSCESS AND METHODS OF DRAINAGE: Henry P. Cahill (Trans. Amer. Acad. of Oph. and Oto., 1929, Page 96). In abscess of the temporo-sphenoidal lobe the approach must be made either by a bone flap, a temporo-parietal decompression, a subtemporal decompression or through the mastoid tegmen. The bone flap approach gives a large field and theoretically has the advantage, but practically in the hands of the otologist this is not so. The subtemporal decompression is valuable in moribund cases with a sclerotic mastoid.

The approach through the mastoid has given a higher average of recoveries than any other method. Here the granulations on the dura or the exposed dura are a guide to the meningeal or intra-cerebral abscess in over fifty per cent of cases. Here the abscess is frequently near the cortex and at times opens to it by a fistulous tract. The cortical cells do not belong to any important cerebral center in this area. The ideal treatment would be to remove the abscess, in toto, but there are several insurmountable obstacles in the way of its success. In frontal and temporo-sphenoidal abscess, especially if it is on the right side, the King technic must be given ample consideration.

The other methods vary from complete evacuation and inspection of the lining capsule with the encephaloscope, to simple repeated punctures. The removal of a cone of cerebral tissue reaching to the capsular wall has proved very satisfactory, using the large drainage tube. The drain when in proper position should not be disturbed for from four to six weeks; after this time the stay sutures may be removed and the brain allowed gradually to expel the drain. Lipiodol injection is indicated in all drainage cases with persistent purulent discharge, headaches or any questionable symptoms, since the tube may be outside the capsular wall. The para-mastoid route, through Trautman's triangle, with at times obliteration of the lateral sinus, is the way of choice in cerebellar abscesses in which the symptoms or signs of labyrinthine involvement preceded those of cerebellar infection. If the abscess is secondary to sinus involvement, drainage through the inner sinus wall is preferred.

L. G. Flanagan, M.D.

GYNECOLOGY AND OBSTETRICS

THE HYDROGEN-ION CONCENTRATION OF THE BLOOD IN ECLAMPSIA: H. J. Stander, M.D., and N. J. Eastman, M.D., Baltimore, Md. (Amer. Jour. Obst. and Gynec., Vol. XX, No. 6). A report of the findings in a study of eight additional cases of eclampsia further strengthened their belief that eclampsia at the time of convulsions is associated with a true acidosis, due to an uncompensated alkali deficit, as is demonstrated by a definite increase in the hydrogen-ion concentration. Also, they believe that the acidosis probably should not be regarded as a causal factor, but rather as the result of the eclamptic convulsion, and by itself is sometimes severe enough to cause death.

The increase in the hydrogen-ion concentration of the blood immediately following an eclamptic convulsion often reaches the level of a true acidosis, and the eclamptic patient usually overcomes this by lowering the carbonic acid through deep breathing, resulting in transitory periods of acidosis following convulsions. If, however, the patient is unable to overcome the acidosis, death may ensue unless proper anti-acidosis treatment be given. They recommend following the CO_2 combining power of the blood as an index of the acid-base equilibrium.

Russell J. Moe, M.D.

AN ANALYSIS OF FIFTY CASES OF TOXEMIA OF PREGNANCY: P. D'Acierno, M.D. (Amer, Jour. Obst. & Gynec., Vol. XX, No. 6). An analysis of fifty cases of toxemia of pregnancy following Stander's classification with the number of cases in each group:

		Number of cases
I	Eclampsia	21
II	Pre-eclampsia	8
III	Low Reserve Kidney	8
IV	Chronic Nephritis Complicating Pregnancy	8
V	Hyperemesis Gravidarum	5

There were no cases of acute yellow atrophy or impetigo herpetiformis.

In the eclamptic group 62 per cent were primiparæ as against 38 per cent multiparæ. The higher percentage of primiparity in eclampsia is, in his opinion, due to the fact that in the first pregnancy the different body-systems fail to adequately adapt themselves to the demands of the fetal parasite, and respond with an exaggerated abnormal reaction, which resolves itself into the eclamptic attack; in multiparæ there appears to be in action a better mechanism of adaptation between the mother and fetus, as though a sort of relative immunity had been acquired in a previous pregnancy. Acute infectious disease was common in the first four groups and may be considered as an important factor in the production of renal and hepatic impairment.

The "low reserve kidney" (Stander) is one which, handicapped by some cause, either congenital or acquired, is unable to function at full capacity under the stress and strain of pregnancy.

The carbon dioxide combining power was found to be definitely decreased in eclampsia, pre-eclampsia and chronic nephritis. He believes this finding to be a good index of prognosis. The blood sugar values were increased in all groups except hyperemesis gravidarum.

Increased blood pressure was found in all groups except hyperemesis, where instead there was hypotension.

Maternal mortality was 8 per cent; the fetal mortality 25.5 per cent, or, deducting stillbirths, the corrected fetal mortality was 21.5 per cent.

Russell J. Moe, M.D.

CONCERNING SPASMODIC CONDITIONS OF THE UTERUS AND TREATMENT: P. Burger (Gynecologie et Obstetrique, Tome XXII, No. 1). The author considers a rather vaguely defined condition which is characterized by short ineffectual uterine contractions which become extremely painful and cause long delay during the second stage of labor. These vary greatly both in frequency and intensity and contribute nothing to the progress of labor, but are most exhausting to the patient. Walthard gives four types: clonic contractions, tetany of the uterus, stricture of the uterus with spasm of the internal os, and trismus or spasm of the external os. The author recognizes three types of uterine contraction: (1) normal, (2) hypotonic or weak contractions, and (3) exaggerated hypertonic contractions with insufficient relaxation intervening. Clinical differentiation is difficult.

The cause is usually associated with relative obstruction or interference, resulting in hyper-excitability of the sympathetic nervous system, similar to that seen in spasmodic constipation or certain forms of ileus. The obstruction may be due to fetal or pelvic dystocia, and to conditions of the uterus itself. He considers only the latter factor. Slow effacement of the cervix with painful spasm may be due to constitutional factors, sometimes familial, which is relatively rare, scar tissue in the cervix resulting from lacerations or infection from gonorrhoea or previous instrumentation.

Interference with normal uterine function by presence of large amount of amniotic fluid. Recognition of the condition of hypertonus is most important as it must be overcome before labor can progress.

Concerning treatment, the author suggests: The use of hypnotics or narcotics hypodermically or by rectum; early rupture of membranes, incisions of the cervix, or, in case of dense scar and spasm, vaginal or abdominal hysterotomy.

A. L. McDonald, M.D., F.A.C.S.

THE INCIDENCE OF PUERPERAL INFECTION DUE TO ANAËROBIC STREPTOCOCCI. T. K. Brown (Amer. Jour. Obstet. and Gynec., Vol. XX, No. 3). The author brings out the importance of anaërobic organisms, especially streptococci, as a cause of puerperal infection. He reviews the studies of Schottmuller, Harris, Brown and others. This is a continuation of studies made in conjunction with Schwarz and Dieckman in St. Louis. A large percentage of their cases of infection were due to anaërobic non-hemolytic streptococci not shown in ordinary blood cultures. They believe that these organisms enter the body from the vagina. As a prophylactic measure they have been using a vaginal instillation as suggested by Bessesen, during labor:

Mercurochrome crystals, 15.
Tctr. iodin one-half strength, 5 c.c.
Glycerine, 500 c.c.

This is used to destroy the anaërobes present in the vagina and is repeated every twelve hours during labor or following premature rupture of the membranes. Since this routine was established three years ago the morbidity and mortality from puerperal sepsis has been reduced more than one-half.

A. L. McDonald, M.D., F.A.C.S.

FIBROMYOMATA UTERI, TREATMENT AND END-RESULTS: Keene and Kimborough (Amer. Jour. Obstet. and Gynec., Vol. XX, No. 2). Here is presented a valuable study concerning indications, methods, and results, based on many years experience and careful observation. The report includes 245 consecutive cases which required treatment because of the following symptoms: menorrhagia, 62 per cent; metrorrhagia, 9 per cent; lumbo-sacral pain, 27 per cent; pressure symptoms, 29 per cent.

Radium is chosen for women in the fifth decade with tumors smaller than three months pregnant uterus, where bleeding is the only symptom. They accept as contra-indications to radium:

1. Tumors larger than a three months pregnancy because of frequency of degeneration, and disease of the adnexa, also distortion of the uterine cavity which interferes with a satisfactory curettage.
2. Recent rapid increase in size of the tumor.
3. Presence of pressure symptoms.
4. Tumors associated with pelvic pain because of frequency of tubal or ovarian lesions.
5. Pedunculated tumors.
6. Profound anemia out of proportion to loss of blood, as this may indicate degeneration of the tumor.
7. Uncertain diagnosis, and never without diagnostic curettage.
8. Stenosis of the cervical canal.
9. Tumors in young women or those who are unduly nervous.

The authors find that from year to year a larger per cent are selected for surgery, largely from more rigid adherence to contra-indications for radium. In this series 21.4 per cent were treated with radium. The dosage has been decreased to from 600 to 900 milligram hours, to be followed by *x*-ray if necessary.

X-ray was selected in 4.7 per cent where the tumors were complicated by adnexal disease or who were poor operative risks because of profound anemia, or in the presence of large tumors in patients where surgery was contra-indicated.

Surgical treatment was offered in 180 cases or 73 per cent; vaginal myomectomy in 3.3 per cent; abdominal myomectomy in 6.4 per cent.

Hysterectomy was usually selected, conserving at least one ovary in situ whenever possible. They prefer subtotal hysterectomy, believing that with proper treatment of the cervix the risk of subsequent cancer is much less than the added risk of total hysterectomy.

A. L. McDonald, M.D., F.A.C.S.

MEDICINE

EPITUBERCULOSIS: B. Goldberg and B. M. Basal (Amer. Jour. Med. Sci., December, 1930, 824-832). Massive areas of pulmonary infiltration in children having positive tuberculin reaction were formerly considered of grave prognosis.

Eliasberg and Neuland in 1920 found this conception erroneous, demonstrating cases with subacute onset and course, extensive physical signs, heavy, dense, well demarcated *x*-ray findings, with gradual disappearance of both signs and shadows in a few weeks or months, with exception of enlarged hilus glands and the positive skin reaction.

They differentiated the condition from caseous tuberculous pneumonias, and from chronic non-tuberculous pneumonias, chiefly by the history of acute onset in each case, and the presence of lower lobe involvement.

They note in epituberculosis the presence of nonspecific involvement on specific tuberculous soil.

The condition had been earlier described by Grancher, Bourdel, Hutinel, Sluka, Ranke, Tendeloo, Frankel, Ribadeau, Dumas, Gravinhoff, Engel, Epstein, Gohn, Langer and others, under the terms splenopneumonia, para- and perituberculosis and epituberculosis. Goldberg and Gasul report ten cases with roentgenograph study, one of which indicated a re-infiltration of the entire right lung following a tuberculin test. They conclude with a summary of these cases, showing that epituberculous infiltrate is intimately associated with the reactions of the tubercle bacillus or its toxins, and are uncertain whether the epituberculous area is a collateral inflammation, or an atelectasis due to blockage from hilum pressure, or a truly parenchymal involvement. The bibliography is complete.

J. G. Lamont, M.D.

SOME PROBLEMS IN THE DIAGNOSIS AND TREATMENT OF THYROTOXICOSIS: Fred E. Ball, Chicago, Ill. (Am. Jour. Med. Sc., Nov., 1930). Thyrotoxicosis presents many problems which at times cause great difficulty in diagnosis or treatment. The basal metabolism has always been considered of great value in the diagnosis of thyrotoxicosis, but the author wishes to call attention to a group with only slightly elevated rates. In contrast, several cases have been observed with typical symptoms of thyrotoxicosis but with a normal rate. However, this rate tends to become elevated later on without any particular change in the symptoms.

Summarized, the author believes that the symptoms of thyrotoxicosis may be present preceding a rise in the basal metabolism. Too much attention should not be given to one normal reading when the clinical picture suggests a thyrotoxicosis.

Hypometabolism and myxedema are two different things and should not be confused. There is a group of cases which following thyroidectomy develop myxedema and which cannot be returned to normal by thyroid medication.

A recurrent thyrotoxicosis may exist where no thyroid tissue can be demonstrated.

The relationship of pregnancy and thyrotoxicosis is associated in a sufficient number of cases to bear careful study, and the connection between them, if any, is not at the present time clear.

RICHARD BARDON, M.D.

THE ADRENALIN TEST AND CHOLESTEROL DETERMINATION IN THE DIAGNOSIS OF BORDERLINE HYPERTHYROID: J. William Hinton (Amer. Jour. of the Med. Sci., Nov., 1930). The author has made use of the adrenalin test as advocated by Goetsch, and in addition a determination of the leukocyte and differential counts taken before the injection, and at 15, 45 and 90 minute intervals after the injection. This addition was recommended by Goetsch in 1929.

In the positive cases of hyperthyroidism definite uekocytosis is produced after the injection.

In addition, complete blood chemistry studies, with particular reference to the cholesterol findings, were also included. He felt that there might be a disturbance in the cholesterol metabolism.

All in all, observations were made in twenty-six cases, and they came to the conclusion that as an aid in the diagnosis of borderline hyperthyroidism, the adrenalin test, with the leukocyte and differential counts added, has not been of any assistance in making the diagnosis.

There were no typical findings as far as the cho-esterol content of the blood was concerned.

He came to the conclusion that the test seemed to be so delicate that any patient with a thyroid enlargement will give a positive reaction unless a definite hypo-hyroidism is present.

RICHARD BARDON, M.D.

SURGERY

THE TREATMENT OF HARELIP AND OTHER FACIAL CLEFTS: Prof. Dr. Fritz F. Hartel, First Surgical University Clinic at Osaka, Japan (Der Chirurg, Vol. II, No. 23, December 1, 1930). The author reviews recent advances in the treatment of harelip, and adds thereto his technic of operation, lay-ng stress on the fundamental principles involved, the attention to which will bring about a good cosmetic and functional result. He reviews the more recent work of authors in the development of this operation, and mentions especially:

Escher, who, in 1920, described the double row suture; Drachter described the simple angular refreshing of he vermilion borders; Ramstedt, in 1922, described the manual replacement of the premaxilla; H. Meyer, in 926, described the building up of the upper lip in three ayers, and the reconstruction of the nasal floor; H. Ehrenfeld, in 1926, described the reconstruction in con-inuity of the lip musculature with a three-row suture; A. Hagendorn, in 1923, described the plastic of the nares; V. P. Blair, in 1928, described his method of mensuration, and careful correction of nasal deformity, and of the curve of the lips; F. Hartel, in 1929, described reconstruction of the ideal center of the lip, muscle, suture, and mensuration.

These references give, as the author's background, the more recent developments in this work, as they appear in the German literature. In carrying out his present technic, Hartel lays down the following fundamental facts:

1. All tissues are present; the cleft denotes no division, but a separation of continuity; the parts have spread away from each other, the muscles retracted, the skin piled up, and has rolled in. It is as if an earthquake had thrown apart the building stones of the upper lip; if we can set each stone again in its proper place, the structure will be complete, and the natural architecture will remain.

2. The most important component of a building is not the façade, but the supporting structures; if these are missing or do not function properly, then one cannot cover these defects with superficial structures only, and expect good cosmetic or functional results; the supporting structure, in this instance, is the musculature. Thus, the fundamental object to be obtained is the reconstruction of the concentric muscular ring of the mouth and nose.

3. By the deft exposure and suture of the pliable muscle layer, it is surprising how easily one can get a good skin and vermilion border suture. All tension is gone, making it unnecessary to use complicated sutures, and naturally one attains a nicer cosmetic result. One cannot retain the proper relations unless one uses a compass and millimeter rule, and one does not tie sutures until all measurements coincide.

The author then describes in detail the carrying out of these principles as they are practiced, and have proven quite successful in his hands.

The author also applies these principles to the repair of defects in the oral cleft, due to disease or injury.

While nothing distinctly new is offered to the man conversant with the development of harelip surgery, yet to him, especially, the reading of this article completely, will well repay the effort.

A. E. SOHMER, M.D.

THE SURGERY OF DIABETES AS IT CONCERNS GANGRENE OF THE LOWER EXTREMITIES AND CARBUNCLES: Urban Maes, M.D., (Surg., Gynec. & Obstet., Nov., 1930, p. 700). Insulin has reduced operative mortality from 50 per cent to a range between 2 to 10 per cent. The number of diabetics is steadily increasing. Diabetics are susceptible to two particular surgical diseases: gangrene, chiefly of the lower extremities; and infection, chiefly in the form of carbuncles of the neck. Infection reduces the efficacy of insulin from 50 to 75 per cent.

In operating upon diabetics an extremely close cooperation between surgeon and internist is important, both before and after the operation. Diet and insulin therapy must be controlled with almost mathematical precision. Diabetics with infection must be treated before and after operation as if coma were impending.

Use of ether is contra-indicated because of its tendency to acidosis and hyperglycemia. Local anesthesia is contra-indicated because of local tissue injury resulting in great susceptibility to infection. Ethylene is most generally satisfactory, but, where contra-indicated, spinal anesthesia may be used.

Gangrene in diabetes is usually superimposed upon an already existing arteriosclerosis. The latter occurs earlier by 10 years (Eliason) than the usual arteriosclerosis. It is followed by infection or may follow infection and in the latter case is due to poor hygiene of the feet, wearing ill fitting shoes and hose, use of radical corn cures and the cutting of corns and calluses.

Operation for gangrene must be done early. Emergency operations are evidence of lack of co-operation between internist and surgeon somewhere along the line.

Heidenhain held that amputation should be done above the knee, because of better collateral circulation, resulting more likely in primary healing. However, it is known that the mortality rises the nearer the amputation is done toward the trunk and secondly an artificial limb can seldom be satisfactorily fitted above the knee, that is, leverage for manipulating the leg is lacking.

The author believes the chief reason for failure of primary healing below the knee is not defective blood supply but a too elaborate technic, namely beveling, flap formation and complicated dissection. These invite gangrene and infection.

The author amputates at the junction of the middle and upper third of the leg by the old method of Kocher, which was widely used in the war.

The skin is incised and allowed to retract. The muscles are cut at the level of the retracted skin. The bone is cut at the level of the retracted muscles. About four sutures are inserted into the deep aponeurosis drawing the tissues over the face of the stump. The same number are used to approximate the skin. No tourniquet is used. Vessels are ligated individually. Careful hemostasis is important. No drainage is used, because it invites infection.

The author had only two deaths in approximately sixty cases and these occurred in pre-insulin days. In the rest all but two cases resulted in primary union.

In the treatment of carbuncles of the neck the grid-iron incision is used exclusively. This consists of a series of parallel vertical incisions extending deep into the carbuncle and extending outward into the surrounding healthy tissue. Bleeding is controlled by gauze soaked in 1 per cent carbolic acid solution.

Harold J. Dvorak.

ACUTE PANCREATITIS, ABDOMINO-LUMBAR TRANSFIXION IN THE DRAINAGE OF ACUTE PANCREATITIS: F. Ody, Geneva, Switzerland (La Presse Medicale, No. 29, 1930, No. 96). The author describes the anatomy of the region of the pancreas, and mentions a method of drainage which he has found satisfactory in the treatment of acute pancreatitis; without going into the disputed etiology of this condition, taking it for granted that at the present stage of knowledge, early and thorough drainage is indicated, and that drainage through the anterior abdominal wall is not always satisfactory.

A method is mentioned by which both anterior and lumbar drainage is used in this condition. The technic is as follows:

Median anterior incision, going through the large omentum, exposing the superior border of the pancreas; a preliminary palpation of the gland, to determine its pathology, is made; the insertion of drains is made above the splenic artery, thus avoiding the superior pancreatic arterioles, and being careful not to wound the splenic veins. A left lumbar incision is then made, dissecting to the renal hilus; again looking for the splenic vein, avoiding this, bluntly breaking through the tissues until the pancreas is reached; drains are placed below or behind the same. This method of drainage is especially useful if necrosis is extensive in the caudal end of the pancreas. If necrosis is extensive in the head, then it might be practical to put anterior drains to the right of the duodenum, in addition to, or in place of, the sub-omental drains.

Two illustrations accompany the article.

A. E. Sohmer, M.D.

PEDIATRICS

THE INFLUENCE OF FEEDING ON CERTAIN ACIDS IN THE FECES OF INFANTS: Jesse R. Gerstley (Amer. Jour. Disease Child., Vol. 40, July, 1930, Pages 27-45). The author is reporting on the influence of diet on the excretion of volatile, lactic and total titrable acids as well as on the hydrogen ion concentration in the feces of infants. Some eight years ago Gerstley and his coworkers started on their work with the supposition that the feeding of lactose in cow's milk would produce harmful effects upon the health of the child and would show in the stools, perhaps giving diarrhea. Their results to the contrary seem to indicate that the feeding of three per cent lactose in the milk mixture produces a decidedly beneficial effect both on the general health of the child and the character of the stools excreted. The child gains in weight, appears better, and the total amount of the feces is diminished. The general appearance of the stool, as well as the hydrogen ion concentration, changes to resemble that of the breast fed child.

Their observations were that the total amount of the stools of the child fed on cow's milk without lactose were more bulky than the stools of the breast fed child, also it is more alkaline in reaction—although the total amount of acid excreted in twenty-four hours is greater in the artificially fed child than in the breast fed. The feeding of a three per cent lactose in the milk mixture for a long time showed no diarrhea or any other harmful effects, but to the contrary showed improvement in the children so fed and at the same time the bulk of the stools, the general appearance of the stools as well as the hydrogen ion concentration of it resembled that of the breast fed child.

The feeding of a twelve per cent lactose in the milk mixture for several weeks produced symptoms of alimentary intoxication with a drop of weight but produced no diarrhea. The author therefore suggests that indigestibility of cow's milk is not responsible for diarrhea in childhood. He is also favorably impressed with the value of giving three per cent lactose in the milk formula.

In reviewing the literature the author notes two schools of thought:

1. One holds that gastro-intestinal influences such as pathological, chemical, bacteriological, or physiological changes lead to diarrhea and nutritional disturbances.
2. The other holds that diarrhea is secondary to a disturbance in metabolism and nutrition, especially from the work of Czerny and Finkelstein, who are directing more attention to general body metabolism. According to them diarrhea is a complication of a disturbance in general body metabolism arising from intestinal fermentation due to improper use of carbohydrates by the body.

Aaron Friedell, M.D.

IMMUNITY TO POLIOMYELITIS IN MOTHERS AND THE NEWBORN AS SHOWN BY THE NEUTRALIZATION TEST: W. L. Aycock and S. D. Kramer (Jour. Exp. Med., 53, 457, Oct. 1, 1930). Aycock and Kramer call attention to the fact that elsewhere they have presented evidence indicating that immunity to poliomyelitis is widespread, bearing a direct relationship to age and concentration of population, and in inverse relationship to the incidence of the disease in all age groups. They found the immunity to exist least often in the one to five year age group, and especially is this true in those of the rural districts.

In order to determine whether the relatively low incidence of poliomyelitis in infants is due to a temporary maternal passive immunity similar to that noted with respect to diphtheria, the authors tested the blood sera of a group of twelve mothers together with the sera from the cord blood of their newborn infants for the presence of neutralizing substance for the virus of poliomyelitis. The sera were mixed with the virus suspension, incubated for two hours, placed in the ice box over night, and inoculated intracerebrally into rhesus monkeys. The neutralization tests for the virus of poliomyelitis revealed that immunity was present in ten out of twelve infants, and in ten out of twelve mothers, with complete correspondence between the mother and infant. These tests point to passive transmission of an immunity to poliomyelitis from the mother to her infant. Previous tests on older children (one to five years), however, indicate that the passive immunity the infant receives from its mother is transitory.

C. A. Stewart, M.D.

STUDIES IN THE COMMON COLD: Experimental transmission of the common cold to anthropoid apes and human beings by means of a filterable agent. A. R. Dochez, G. S. Shibley and K. C. Mills (Jour. Exp. Med., 52, 701, Nov. 1, 1930). In this study of upper respiratory infection usually grouped under the heading of common cold, the author's primary interest was in its etiology. In earlier works two groups of organisms were investigated for possible causative relationship: (a) the bacteria more readily cultivated from the upper respiratory tract, and (b) the group of Gram-negative, filter-passing anaërobes first described by Oletzky and Gates. Dochez, Shibley and Mills found that colds may be transmitted to man and chimpanzee by intranasal inoculation of filtered nasal washings from which the filter-passing Gram-negative anaërobes of Oletzky and Gates were absent. They conclude, therefore, that certain types of infectious colds are caused by a filterable agent.

C. A. Stewart, M.D.

RAPIDITY OF IMMUNIZATION WITH DIPHTHERIA TOXOID: M. Cooperstock, M.D., Ann Arbor, Mich., and G. F. Weinfeld, M.D., Ravinia, Ill. (Amer. Jour. Dis. of Children, Nov., 1930, Vol. 40, No. 5). In a previous report, the authors submitted their results with the use of diphtheria toxoid, concluding that this material has a high immunizing value, and that, by virtue of certain important advantages that it possesses, it recommends itself as an ideal agent in vaccination against diphtheria.

In a group of fifty subjects, a negative Schick reaction developed in twenty-nine, or 58 per cent, three weeks after the second injection. In a second group of forty-four subjects, it was found that in thirty-five, or 79.5 per cent, the reaction had become negative in nine weeks. A third group, retested at the end of from sixteen to twenty-two weeks, revealed that of sixty-five subjects, sixty, or 92.3 per cent, showed negative reactions to the Schick test.

It has been the author's custom in the routine procedure for diphtheria prophylaxis with toxoid to use two injections of 1 c.c. each, with an interval of three weeks between injections. A third injection administered at the end of six months to those subjects who still give positive reactions to the Schick test, will probably be sufficient to immunize most of the small remaining number. Ramon and Helie stated that from 90 to 95 per cent are immunized in from five to eight weeks. Bloomberg and Fleming reported an immunity of 84 per cent at the end of eight months, with the employment of two injections of 0.5 and 1 c.c., respectively.

The interval between injections is a factor of considerable importance. Injections spaced too closely may bring about the so-called "negative phase" in circulating antitoxin and a delay in the production of immunity. For example, in a group of twenty-seven subjects, each of whom had received two doses of 1 c.c. of toxoid, with an interval of only one week between injections, it was found that the Schick test was negative in only 29.3 per cent from three to five weeks after the second injection. The result seems significant when compared with the much higher immunity of 58 per cent obtained after a comparable time with the same dosage, but with intervals of three weeks between injections.

It is suggested that the employment of two injections of 1 c.c. each, three weeks apart, is, for practical purposes, an adequate routine procedure in diphtheria vaccination. It is pointed out that spacing the injections too closely may delay the production of immunity.

R. N. Andrews, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

OBSTETRICS. J. W. Williams. 6th enlarged and revised edition. 1,157 pages. Price $10.00. New York: D. Appleton & Co., 1930.

It is quite impossible to offer any remarks of endorsement of this book in addition to that conveyed by the name of the author. This edition contains over 1,100 pages of reading matter, and it has many additional illustrations. The author devotes a rather lengthy chapter to that great question of cesarean section and the additional operations of sterilization and hysterectomy. He discusses very interestingly the low cesarean section. The book is brought up to date in all respects, even the latest tests concerning the early diagnosis of pregnancy.

A. G. Schulze, M.D.

THE BLOOD PICTURE AND ITS CLINICAL SIGNIFICANCE. V. Schilling, translated by R. B. H. Gradwohl. Price $10.00. St. Louis: C. V. Mosby Co., 1929.

For those interested in the value of nuclear changes in leukocytes as having a definite prognostic significance, this volume will prove of value. Schilling has simplified Arneth's classification, dividing the neutrophils into five groups according to their degree of maturity, as shown by the development of the nucleus. The appearance of youthful or immature forms he considers proportionate to the severity of the infection, and is supposed to be an index of the general resistance of the body. The author has gone into the interpretation of these variations in considerable detail. All other phases of hematology are given inadequate attention, as the author is obviously interested only in riding his hobby.

Thomas Myers, M.D.

MANUAL OF THE DISEASES OF THE EYE: Charles H. May, M.D. 13th ed. 461 pages with 374 original illustrations including 23 plates with 73 colored figures. Price $4.00. New York, Wm. Wood & Co., 1930.

This manual deservedly maintains its position as the most widely used work on the eye for students and general practitioners. It is now in its thirteenth edition in the United States, sixth British edition, eighth Spanish edition, fifth French edition, fifth Italian edition, fifth Dutch edition, second German edition, second Japanese edition, and second Chinese edition.

In this new American edition some chapters have been re-written, some altered, and some additions have been made in order to keep the book abreast of current practice. Five pages on the slit lamp and corneal microscope from the pen of Mr. T. Harrison Butler is a new contribution. This printing retains all the excellent features of the old editions, the clear lucid style, the profuse excellent illustrations and fine color plates, and the dependability of the subject matter. It is a work to be highly recommended for use by the student and the general practitioner.

Harold Rothschild, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

FOR SALE—Instruments and office equipment of the late Dr. A. E. Comstock. See or address Dr. C. F. McNevin, 714 Lowry Building, Saint Paul, Minnesota.

PHYSICIAN'S OFFICE FOR RENT—Best location Midway district, corner Thomas and Hamline, Saint Paul. Rent $25.00 a month. Inquire at dentist's office.

FOUND—On road between Excelsior and Chaska, physician's bag containing instruments. Address Dr. C. K. Holmes, 702 Physicians and Surgeons Building, Minneapolis, Minnesota.

WANTED—Doctor to share office in Medical Arts Building. Office now available mornings and until 3 o'clock in the afternoon. Address D118, care Minnesota Medicine.

WANTED—By 1927 Minnesota graduate, an assistantship location or locum tenens in Minnesota. Can arrange personal interview. Address D117, care Minnesota Medicine.

EXCELLENT PRACTICE—Available immediately to purchaser of equipment and drugs. Small cash payment. Southwestern town and country over 500. Specializing. Address D-119, care Minnesota Medicine.

FOR SALE: North Dakota, large German practice, unopposed. Will consider only an industrious man. Address D-116, Minnesota Medicine.

LOCUM TENENS WANTED—Experienced, well qualified physician desires locum tenens. Registered in Minnesota. Address D-120, care Minnesota Medicine.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XIV March, 1931 No. 3

PRESENT THEORIES CONCERNING THE ETIOLOGY OF ACUTE RHEUMATIC FEVER*

Ralph A. Kinsella, M.D.
Professor of Medicine, St. Louis University School of Medicine
St. Louis, Missouri

THE researches of Swift and his associates have not only offered a new theory for the etiology of acute rheumatic fever, but have at the same time quickened the study of other infections from a new standpoint. Investigators are striving to evaluate the influence of allergy in the production of symptoms. It is being realized that a so-called infectious disease may not always present a group of symptoms resulting from the contact of the human body with pathogenic microörganisms, but may offer a clinical display, the result of a second contact which follows closely upon a previous experience of a similar kind. The factors which underlie this statement are not always clearly determined.

Acute rheumatic fever had usually been regarded as an acute infection which resulted from the single or first contact of the human organism with some bacterium. Many believed this bacterium to be a streptococcus; others held that the etiological agent was as yet unknown. It is significant that while the proof that a streptococcus was the cause of the disease was not widely accepted, no other form of bacterium was being considered as etiological. In an early communication, Swift and Kinsella[1] denied any causative relationship for the streptococcus even while reporting an incidence of 11 per cent of positive blood cultures. At the same time the reports of Rosenow[2] and Poynton and Payne,[3] describing a high incidence of positive cultures from blood and joints found only limited favor.

One of the chief obstacles to the ready acceptance of the streptococcus was found in the conviction that the pathology of acute rheumatic fever was specific and never found in other diseases in which streptococci were known to be active, such as subacute streptococcal endocarditis. This attitude was clearly defined in the arguments of Thalhimer and Rothschild.[4]

It is extremely interesting to note in how far the old attitude of doubt has been changed by the newer data and equally interesting to scrutinize these data and discover in how far they fail to be valid.

Swift[5] began by considering the similarity between the manifestations of acute rheumatic fever and those of tuberculosis and syphilis which are regarded as allergic. The inevitable inference was, that acute rheumatic fever employed the mechanisms of allergy. Then he observed for the first time[6] that living streptococci injected intradermally in rabbits produced not only an immediate inflammation, but, at a later date, a second milder inflammation which occurred even though no living streptococci could still be demonstrated in the skin. From this it could be inferred that streptococci could produce effects through allergy.

Finally,[7] patients suffering from acute rheumatic fever were found to give positive reactions to intradermally injected killed cultures of streptococcus. From this it could be inferred that the allergic manifestations of acute rheumatic fever were incited by the activity of streptococci, although intradermal reactions are uncertain tests of specificity.

The fact that allergy influences the reaction of the body is apparently true in another form of acute rheumatism in which the etiology is clear, namely gonorrheal rheumatism. If histories are carefully obtained in cases of this disease it is found that rheumatism never attends as an early accompaniment of urethritis, but occurs after several weeks or months have elapsed. In the meantime, gonococci are evidently alive but localized. Frequently an entirely unrelated event, such as an acute respiratory infection, seems to be instrumental in permitting the localized gonococci to invade the blood stream and produce acute vascular damage. A recent case illustrates this point. A young woman, known to have had pelvic infection a year previously, became ill with fever and acute inflammation of the throat. The tonsils were prominently enlarged and yielded rich cultures of streptococcus hemolyticus. A series of painful joints followed and after a week the wrist became acutely and persistently inflamed, although the signs in the pharynx subsided. No signs developed in the pelvis. The wrist was drained by incision and gonococci were isolated in pus and then found in urethral smears.

---

*Read before the annual meeting of the Minnesota State Medical Association, Duluth, Minn., July 15, 1930.

In other words, the human body seems to have one set of reactions when it comes into contact with a disease-bearing bacterium the first time, but an entirely different response if it meets the same organism a second time while still under the influence of the first contact. This alteration of behavior is what is meant by allergy.

In the case of acute rheumatic fever a streptococcal pharyngitis may correspond to the gonococcal urethritis, and a secondary inciting cause such as an intercurrent infection, may precipitate a fresh contact between the body and the streptococcus which is attended by a diffuse vascular reaction recognized clinically as acute rheumatic fever. But a quite different mechanism may operate. In the case just described it is seen that a patient with chronic urethritis can acquire gonococcal rheumatism following an acute streptococcal pharyngitis. Likewise, animals suffering from chronic streptococcal arthritis without bacteriemia can display a positive streptococcal blood culture after acquiring the unrelated disease of "snuffles." In other words, the incident which precedes gonorrheal rheumatism need not be closely related, and the incident which precedes most cases of acute rheumatic fever, namely a so-called streptococcal pharyngitis, may in reality bear no bacteriological relationship to the disease. According to this last view the etiological agent would remain, and the sore throat be an accidental intercurrent disease precipitating the secondary reaction called acute rheumatic fever.

Therefore while there is little basis to doubt that allergy plays a part in the production of acute rheumatic fever, the relationship between the disease and a streptococcus seems to be based on the results of studies by Rosenow,[2] by Clawson[8] and more recently by Cecil,[9] as well as on the studies by Swift[10] just described. The chief remaining objection to accepting the streptococcus as the cause of the disease lies in the alleged specificity of the pathological lesion—the Aschoff body. In diseases known or thought to be caused by streptococci, such as subacute bacterial endocarditis and acute glomerular nephritis, no such lesions can be demonstrated. On the other hand Clawson[11] has declared that the perivascular lesions of rabbits inoculated with streptococci are similar to Aschoff bodies. In a rather extensive experience in this field of experimental endocarditis and experimental arthritis using both hemolytic and non-hemolytic streptococci, we have not been able to conclude that the lesions produced were identical with Aschoff bodies.

The pathology of acute rheumatic fever is that of widespread perivascular reaction, at first exudative and later proliferative, and having a highly specialized character. In its distribution it is similar to the lesions of chronic streptococcal infection in rabbits. The identity of the reaction in the rheumatic nodule, in the heart muscle and in the vessels near the joints has been established by von Glahn[12] and Pappenheimer and by Swift.[10] But the specific character of these lesions has not yet been clearly disputed.

Another objection to the acceptance of the streptococcus as the cause of acute rheumatic fever lies in the fact that the same organism is reported in many other conditions that are unrelated but sufficiently chronic to permit the development of allergy. Again, in a given blood culture from a patient with acute rheumatic fever it is possible to isolate different types of streptococci, in contrast with blood cultures in subacute streptococcal endocarditis where all the colonies are identical.

The modern tendency to emphasize the vascular diseases as primary and such peripheral disturbances as myocarditis, nephritis, and arthritis as merely local manifestations, weakens the idea of bacteriological specificity and makes it unnecessary to believe that a certain selective activity is required for each of these organs to be involved in chronic disease.

The rheumatic lesion of the blood vessels near a joint was found to be unaltered by the symptomatic relief given by neocinchophen.[10] In our studies[13] of the influence of sodium salicylate on the dermal reactions of rabbits which suffered from chronic focal streptococcal infection, it was found that although sodium salicylate prevented allergic dermal responses it in no way altered the character of the vascular lesions.

This effect of sodium salicylate in suppressing the allergic dermal reactions of rabbits may explain the apparent efficacy of this type of drug. By inference, it would indicate that most of the graphic symptoms of the disease, such as the joint pains and the serous effusions, are exudative and allergic activities, with which the drug can successfully interfere.

On the other hand, the failure of the drug to alter the proliferative vascular lesions in animals is in accord with the failure of the drug to prevent the proliferative cardiac lesions in human sufferers. Furthermore, since sodium salicylate does not alter the late pathology we are led to the conclusion that the allergic features of the disease are overlying secondary phenomena of little ultimate importance, while the infected focus, the tonsil, the sinus or some as yet unrecognized area, constitutes the underlying primary factor of great importance which is responsible for the proliferative, crippling vascular damages of this disease. Incidentally the prophylactic administration of salicylate or some related compound given at the time of any respiratory infection, should be most useful. The removal of tonsils and the drainage of the paranasal sinuses has so failed to prevent or arrest the disease that it is suggested that some entirely different atrium of infection is to be located in acute rheumatic fever.

Reviewing the evidence which is available, we can conclude that—

1. Acute rheumatic fever is an acute infectious process in which the body is coming into contact with the causative agent for a second time, while still suffering the effects of the first contact.
2. The evidence that this causative agent is some form of streptococcus is strong but not entirely conclusive.
3. A new approach by chemotherapy is invited by the studies of the effect of sodium salicylate on the allergic dermal phenomena in rabbits.

BIBLIOGRAPHY

1. Swift, H. F., and Kinsella, R. A.: Arch. Int. Med., 19:381, 1917.
2. Rosenow, E. C., Jr.: Jour. Am. Med. Assn., 65: 1687, 1915.
3. Poynton, F. J., and Payne, A.: Researches on rheumatism, London, 1913.
4. Thalhimer, W., and Rothschild, M. A.: Jour. Exp. Med., 19:417, 1916.
5. Swift, H. F.: Am. Jour. Med. Sci., 170:631, 1925.
6. Swift, H. F., Andrewes, C. H., and Derick, C. L.: Jour. Exp. Med., 44:35, 1926.
7. Swift, H. F.: Jour. Am. Med. Assn.
8. Clawson, B.: Arch. Path., 9:1141 (June), 1930.
9. Cecil, R. L., Nicholls, E. E., and Stainsby, W. J.: Jour. Exp. Med., 50:617, 1929.
10. Swift, H. F.: Jour. Am. Med. Assn., 92:2071, 1929.
11. Clawson, B.: Arch. Path., 6:947 (Dec.), 1928.
12. von Glahn, W. C., and Pappenheimer, A. M.: Am. Jour. Path., 2:235, 1926.
13. Hagebush, O. E., and Kinsella, R. A.: Proc. Soc. Exp. Biol. & Med., 27:922, 1930.

CORONARY OCCLUSION*

Herbert W. Rathe, M.D.
Waverly, Iowa

SUDDEN death due to heart disease seems to be steadily increasing, and coronary occlusion is the most common cause. Since 1920 attention has been focused on this subject and much outstanding work has been done by Herrick, Smith, Pardee, Barnes, and others.

The etiology of coronary disease is as yet not definitely known. Hypertension is no doubt an important factor; however, in my cases it has not been. Anatomical variations play an important part, especially the right angle branching of the left coronary artery, which differs from the branching of the right coronary artery that occurs in the same plane as its subdivisions. Beneke of Berlin believes that the tortuosity of the coronaries creates eddies in the flow of blood; the resultant strain on certain portions of the arteries causes a fibrosis which is a forerunner of occlusion. Others believe that infection plays an important rôle, and no doubt it does in certain cases, syphilis especially.

The pathology of coronary occlusion is myocardial infarction of varying degrees, depending upon the size and location of the artery and the question of whether the occlusion is gradual or sudden. This infarcted area may undergo fibrosis or it may thin out, form an aneurysm, and rupture.

As a rule the onset is very sudden. A large number of these patients will tell you that for some weeks or even months they have had "little twinges of pain" or short attacks of dyspnea and dizziness. The typical picture is that of very severe pain which lasts for some time, often twenty-four hours, and which requires large doses of morphin for even partial relief. The pain may be very slight and the patient complain only of retrosternal constriction, a heavy feeling, or, as some may call it, a discomfort. The areas where the pain is witnessed vary; most often the pain is retrosternal or precordial and may radiate to the neck or to one or both arms. However, it may be referred to the epigastrium, wrist, elbow, or, as in one case I have seen, to the sacral region. Sometimes the patient's complaint will be only of dyspnea or orthopnea; at other times these symptoms will accompany the pain. Nausea accompanied by vomiting sometimes is complained of, and if the pain is in the epigastrium a differential diagnosis from an upper abdominal lesion is very difficult.

On examination the patient presents a very anxious facial expression with a peculiar ashen cyanosis. Several whom I have seen were transfixed with the pain and would not move from the position they were in, no matter how uncomfortable. If the attack is at all severe, shock is a marked feature with a cold clammy sweat and a fall in blood pressure, often to as low as 60 mm. Hg. systolic. The pulse is weak, rapid, and at times irregular. The heart sounds are distant and may be inaudible; a friction rub and alteration of rhythm occur at times. The signs of early congestive heart failure appear in some cases; then one finds râles at the lung bases, an enlarged and tender liver, and albumin in the urine. After twelve to twenty-four hours there is usually a rise in temperature (99.5° to 101° F.) and a leukocytosis (12,000 to 16,000). Emboli to other parts of the body or repeated coronary emboli are apt to occur following the occlusion.

Electrocardiographic evidence is most often conclusive, especially so when repeated tracings on successive days are taken. I have studied thirty-two cases with the electrocardiograph up to the present time, and in my opinion my chief errors have been in not heeding what I would call only minor evidence. The most typical changes are in the R-T segments with a depressed and inverted T in either leads I or III and an elevation in the opposite lead. An inversion of the T wave in lead III alone is not important, but if there is inversion of this segment in lead I or II it is very good evidence of coronary disease. Other signs of coronary involvement are bundle branch block and notching of the QRS with low voltage.

The prognosis in cases of coronary occlusion varies greatly. The average of several large groups of cases shows that about fifty per cent die during their first attack. It is said that the older the patient the better the thrombosis is tolerated. This is due probably to the compensatory circulation formed by the Thebesian vessels as well as by anastomosis between various portions of the coronary system. Many of these patients recover and never have another attack; others will die in a second or third attack or develop a congestive heart failure. There are many who are still alive following attacks eight to ten years ago of what undoubtedly was coronary occlusion. It is well worth our while to remember that some of these cases are not fatal and are worthy of our best efforts in treatment.

---

*Read at the annual meeting of the Southern Minnesota Medical Association, Mankato, Minn., August 25, 1930.

The acute case should have absolute bed rest with sufficient morphin to relieve the pain. When the severe pain has subsided another sedative may be substituted for the morphin, but bed rest must continue for a considerable time. Favorable conditions for extending the patient's activities are a return of the blood pressure level to near normal, improved quality of the heart sounds, absence of subjective symptoms, and, if an electrocardiograph is available, an improvement in the electrocardiogram. Theobromin, theophyllin, and euphyllin are drugs which are used to promote coronary circulation. Experimentally euphyllin has proven the most efficient and clinically I believe it is the most satisfactory. Digitalis is not indicated in the acute stage.

CASE REPORTS

Case 1.—A man, sixty years of age, who had been an office man for years, was first seen by me on April 2, 1930. His family and past medical history was irrelevant. There was no previous hypertension to his knowledge. He did not smoke and was moderate in his exercise. On the evening of March 28, 1930, he had a severe pain in his upper abdomen, which lasted for about an hour. He was nauseated and vomited but got no relief on vomiting. He thought it was acute indigestion. He was in moderate shock, and his blood pressure was 118/78. The heart sounds were distant and of poor quality; there was no friction rub, fever, or leukocytosis. On April 2, 1930, his electrocardiogram showed a negative T wave in lead III and a rounded elevated R-T segment in lead III. On May 21, 1930, he had a negative T wave in both leads II and III. He has been on bed rest most of the summer and at present from all indications is doing well.

Case 2.—A man, forty-seven years of age, had been a machinist for twenty-five years. His father died suddenly at the age of sixty-six years; his death was said to have been due to heart failure. The patient had never been ill before except for a mild attack of influenza in 1918. On December 9, 1929, he had an attack of knife-like pain retrosternally, had marked dyspnea, and could not move for about ten minutes. An uneasy sensation persisted for four days when he had another attack which lasted an hour and radiated to both arms. He had had several attcks since, the most severe one on January 29, 1930, which lasted for twelve hours. Following this there had been a numb sensation in both arms up to February 2, 1930, when I saw him first. At that time he was very ill. The ashen cyanosis mentioned above was marked, and he was very apprehensive. His pulse was very weak, and the heart sounds could hardly be heard. There was no friction rub. There were râles at both lung bases, the liver was enlarged and tender, and there was albumin in the urine. His blood pressure was 108/86, temperature 99.8° F., and leukocytes 12,000. An electrocardiogram showed a negative T wave in leads I and II. He had several more attacks with increasing congestive heart failure and died two months later. An autopsy at the State University Hospital revealed coronary thrombosis with myocardial infarction.

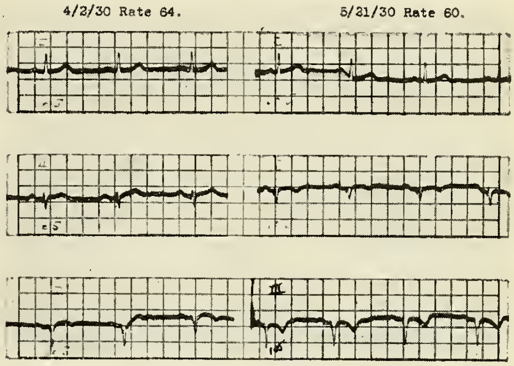


Fig. 1. Case 1.

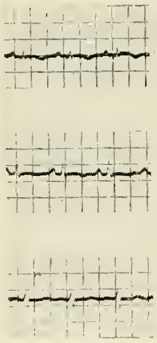


Fig. 2. Case 2.

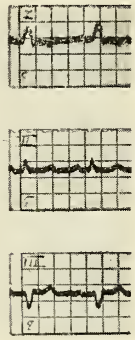


Fig. 3. Case 3

Case 3.—A woman, forty-nine years of age, had been a school teacher for a number of years. She had hyperthyroidism in 1918 and a thyroidectomy had been performed with relief. In December, 1928, she again had hyperthyroidism and was relieved by surgery. At this time her blood pressure was 160/68. Her convalescence was uneventful and she felt fine. On March 14, 1929, while hurrying to a train, she had a severe retrosternal pain radiating to the left elbow. On April 24, 1929, she was weak, listless, and dyspneic on the slightest exertion. Her color was good, pulse regular, and rate normal. The heart examination revealed a systolic murmur along the left sternal border and a split first sound at the apex. Her blood pressure was 148/108. Her electrocardiogram revealed a complete bundle branch block. She remained in bed for three months and her activity was limited for a year. She is now teaching and apparently is in good health.

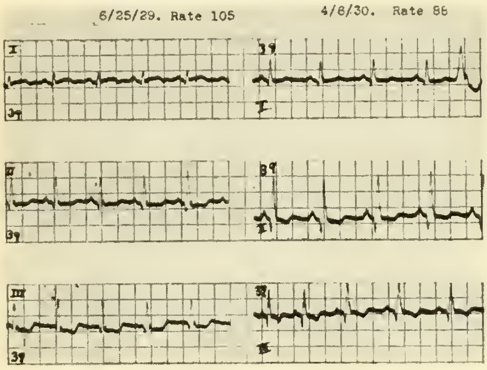


Fig. 4. Case 4.

Case 4.—A man, thirty-seven years of age, whose occupation was farming, consulted me in June, 1929. From December 26, 1928, to January 1, 1929, he had had a mild attack of influenza. On January 6, 1929, he had a severe retrosternal pain lasting from 7 A. M. to 9 P. M. During this time he was dyspneic, perspired freely, and was said to have been very pale. For several weeks following this he had a tight feeling in his chest, but went about his work. On June 22, 1929, he again had pain in the same region, which he thought was even more severe. A physician was called, and a hypodermic was given with some relief. The pain was some better, but was present when I first saw him on June 25, 1929. At this time ashen cyanosis was very apparent and he looked very ill. His pulse was rapid and thready, temperature 101.4° F., and blood pressure 108/86. The heart was enlarged to the left; the point of maximum impulse was diffuse, and his heart sounds were of poor quality. The electrocardiogram at this time showed a depressed R-T in lead III and not so marked in lead II. He was in bed for eight weeks and was up in a chair for four weeks when I again saw him. His blood pressure was 140/108 and his pulse 76; the electrocardiogram was normal. Restriction of activity was advised. He reported again April 6, 1930. At this time he was dyspneic on exertion, had an uneasy sensation retrosternally, and had a numb sensation in both arms. His pulse was 80 and his blood pressure 146/100. The electrocardiogram showed a negative T wave in leads II and III. I sent him home on another course of bed rest, which he did not follow. He had a severe attack while working on May 10, 1930, and expired.

SUMMARY

Coronary occlusion is probably more common in recent years than ever before. It has a definite pathology, a variable clinical picture, and usually a characteristic electrocardiogram. The disease is not always fatal, and if the patient survives the first attack and will follow a regimen of rest and limited activity the prognosis is good. Four cases with electrocardiograms are reported from a series of thirty-two.

BIBLIOGRAPHY

1. Barnes, A. R., Whitten, M. B.: Study of R-T interval in myocardial infarction. Am. Heart Jour., II, 142, 1929.
2. Christian, H.: Disease of Heart. Oxford Man. Diag. and Treat., III, 260.
3. Elliott, A. R.: The coronary problem. Ann. Int. Med., III, 252, 1929.
4. Herrick, J. B.: Atypical features of acute coronary disease. Ann. Int. Med., II, 105, 1929.
5. Nathanson, M. H.: Electrocardiogram in coronary disease. Am. Heart Disease, III, 257, 1930.
6. Parkinson, J., Bedford, D. E.: Successive changes in the electrocardiogram after cardiac infarction (coronary thrombosis). Heart, III, 1195, 1928.
7. Whitten, M. B.: Relation of distribution and structure of the coronary arteries to myocardial infarction. Arch. Int. Med., III, 383, 1930.

SOME CLINICAL FEATURES OF CHRONIC PULMONARY FIBROSIS*

ARTHUR T. LAIRD, M.D.
Nopeming, Minnesota

THE formation in the lungs of new fibrous tissue, while it results from various causes, produces similar clinical phenomena in different diseases and conditions. In certain cases it so masks the symptoms that would otherwise occur that diagnosis is difficult and it may even conceal the primary disease entirely. In other cases it adds to the basic symptoms of the disease, conditions that are symptomatic only of fibrosis.

In this paper while discussing briefly other forms of lung fibrosis, I want to emphasize the changes produced by fibrosis in the clinical picture of tuberculosis, and the necessity of directing the treatment of a case accordingly.

Fibrous tissue is normally present in the body in tendons, ligaments, aponeuroses, fasciæ, in various gland capsules and in certain membranes such as the dura mater. These tissues are composed almost wholly of dense bundles of white fibrils having a course nearly parallel. Between the fibres is ground substance in which are found the cells, irregular and often elongated in form. They are supposed to secrete the ground substance and to be the origin of collagen, which can be converted into glue.

Fibrous tissue is one form of connective tissue and so is related to mucous, reticular and adipose tissue as well as to cartilage and bone, which may sometimes be found in connection with pathological fibrosis.

The abnormal production of fibrous tissue in the body may result from congestion, irritation and from the destruction of parenchyma or other tissues. It may thus be a phase of inflammation. Foreign bodies, dust particles, bacteria and chemical poisons may give rise to it. It is often an attempt on the part of the body to isolate dust particles or disease foci, or to replace destroyed areas with scar tissue. Once under way the formation of fibrous tissue may proceed further than the needs of the body require and become a detriment instead of a benefit.

There are various theories as to the origin of the new fibrous tissue. The majority of pathologists believe it to be derived from fixed connective tissue cells which thus become fibroblasts. Baumgarten, Metchnikoff, Maximow, Krause and others have studied the problem assiduously. The fixed connective tissue cell may be the common ancestor of the fibroblast and of the monocytes of the circulating blood. There have been some attempts to link fibrous tissue formation with cells of the blood or lymph but it is more generally believed that the fibroblast and the epithelioid cells of tuberculosis, arise from old connective tissue cells in situ.

As regards the exact source of the dense fibrils the usual opinion is that they arise from transformation of the fibroblasts, though Baitsell and others consider them to result from a process analogous to clotting taking place in the intercellular substance.

Three chief forms of lung fibrosis may be recognized: the local, involving limited areas in one lung; the diffuse, involving large continuous areas which may extend throughout the greater part of a lung, or even involve both lungs; and the disseminated or generalized, which consists of the presence of scattered fibrous nodules widely distributed, usually through both lungs.

The localized form may be caused by tuberculosis, and other infections, especially when they produce lung abscess. Echinococcus infestation of the lung usually produces it. It follows obstruction to the air passages in atelectasis and infarct. Areas of broncho-pneumonia may become fibrosed. Extra pulmonary conditions such as aneurysm and mediastinal growths may produce it by pressure.

More diffuse fibrosis occurs in tuberculosis, syphilis, influenza, croupous pneumonia and in other infectious diseases. Purulent pleurisy is followed by lung fibrosis more frequently than is generally appreciated. Exposure to irritant gases is said to set in train a course of pathological changes which may ultimately result in the formation of extensive areas of fibrous-tissue.[2] Croupous pneumonia sometimes fails to resolve though less frequently than might be thought; chronic passive congestion sometimes results in "brown induration." Collapsed lungs if long remaining in that state may become extensively fibrotic.

---

*Presented at the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

Pneumoconiosis has been known to the profession for centuries. Paracelsus wrote a book on it. This disease of the lung due to inhalation of various kinds of dust is common but the effects vary with the kind of dust inhaled. Organic dusts are not believed to produce lung fibrosis. Inorganic dusts even vary greatly in the changes produced. Stone cutters, miners of metals found in flinty rocks, grinders and polishers are the most frequent sufferers from miners' phthisis. Coal dust seems to be relatively harmless.

Mycosis of the lungs is claiming more and more attention.

Spirochetal infections frequently produce pulmonary gangrene. Vincent's organism is held responsible in some cases. Infections with yeast-like organisms apparently more often produce fibrosis.

Castellani has prepared quite an elaborate classification based on his experiences in Asia.

The main divisions are: (1) mycosis due to yeast-like fungi; (2) mycosis due to filamentous fungi.

Yeast-like fungi include, among others, blastomyces, cryptococcus, and the monilia (which causes "tea tasters cough"). Due to the filamentous type are the aspergillus infections. These are the cause of pigeon crammer's disease and probably also of an interesting form of lung disease of which Sayers and Meriwether reported 125 cases at the Annual Meeting of the National Tuberculosis Association held in Memphis in May, 1930.

Other fungi which may cause pulmonary mycosis are the various kinds of streptothrix, the actinomyces, and the coccidioides immitis or oidium coccidioides, which is responsible for a disease resembling tuberculosis, of which about a hundred cases have been reported. Most of these have occurred in southern California.

Fungi may be present in the lung as saprophytes, as secondary invaders or as the primary cause of lung disease. While in some cases the symptoms produced resemble those of active tuberculosis, in others the progress of the disease is very slow and its course may be characterized by extraordinary fibrosis.

Carcinomata form the largest group of pulmonary neoplasms. Miller and Jones, discussing primary carcinoma of the lungs, mention two types often confused with tuberculosis. The first is the scirrhous type of disease, which resembles fibroid phthisis. The second is miliary carcinosis, which resembles miliary tuberculosis. In primary carcinoma of the lung the use of the bronchoscope in order to secure tissue for biopsy sometimes clears up the diagnosis. Secondary tumors in the lungs are more common and more readily diagnosed.

Though the causes of lung fibrosis may thus be varied, the pathological findings and the *x*-ray pictures produced may be very similar.

Any part of the lung may be the starting point of fibrosis, the tissue about the bronchi and blood vessels, the interlobular septa, the alveolar walls or the pleura. In the early stages of generalized fibrosis there is peribronchial thickening at the root of the lung; later the parenchyma becomes involved. Affected portions on removal are found to be hard and airless and to resist cutting. The fibrous areas consist of dense grayish tissue which may be most prominent at the root of the lung with radiating bands extending out into the lung especially in non-tuberculosis fibrosis. In the tuberculous form, the process often involves the apex. The pleura is frequently involved and much thickened; apical cavities are often present in the tuberculous form and have thick walls. Dilatation of the bronchi and bronchiectasis occurs in extreme cases. The heart eventually becomes displaced toward the affected side. If the fibrosis is extensive, unaffected areas become emphysematous. Where the fibrosis is widely distributed and consists of multiple areas of dense tissue surrounding scattered implantations of irritating substances, small dense nodules are found embedded in comparatively normal pulmonary tissue. In *x*-ray films various forms of generalized fibrosis may simulate miliary tuberculosis.

The symptoms can be to some extent inferred from the pathological findings. At first the scattered areas of fibrosis may so efficiently enclose the offending foreign bodies that there may be no symptoms whatever, although the disease is progressing. When the cause is not removed, this latent increase in fibrous tissue may continue insidiously for months or even for years. It is especially prolonged in pneumokoniosis. In silicosis it lasts for years. In tuberculosis, even when the disease is not thoroughly arrested, toxemia may be prevented by fibrosis to such an extent that ability to work is lessened but little and the patient may consider himself well, though expectorating tubercle bacilli. A considerable period of freedom from symptoms is also characteristic of pulmonary mycosis.

When the fibrosis has become further advanced dyspnea becomes a prominent symptom. The patient becomes susceptible to repeated colds and to pneumonia, may develop emphysema, chronic bronchitis and bronchiectasis, have cough and expectoration, and even hemoptysis, but in spite of all these symptoms suggesting tuberculosis, he usually has very little or no fever and considers himself in fair general health, though the duration of the fibrosis may have been many years.

The diagnosis of the various forms of lung fibrosis is often difficult. Resemblance to tuberculosis in their clinical course causes difficulty. Repeated sputum examinations may lead to suspicion that tuberculosis is not present or to the finding of the organism responsible for the condition. Occupational history is most important. The site of the lesion is suggestive, the nontuberculous conditions being more frequently at the base than at the apices of the lung. The use of potassium iodide in some of the mycotic infections may be a therapeutic test.

A circumstance that gives rise to much confusion is the fact that tuberculosis is often a complication of other forms of chronic lung fibrosis.

The *x*-ray brings out shadows which are more or less characteristic. Many of them are common to fibrosis in several diseases. They consist of dense hilum shadows and prominent bronchovascular trunks, or of more massive opacities, thickened interlobar septa, broad shadow bands, disseminated nodular opacities, areas of lessened opacity (emphysema), dilated bronchioles and later the outlines of bronchiectatic cavities and of displaced structures.

Three typical forms of chronic fibrosis readily confused are those due to tuberculosis, to dust inhalation and to mycosis. The predominance of fibrosis in a tuberculous lung alters the clinical picture of the disease so completely that it is most important for the physician to be familiar with its effects, one of the most striking of which is the concealing of all evidence of the presence of the disease.

Physical signs and *x*-ray findings may be present for years in cases long since arrested and practically well. There is no advantage to be obtained by placing such individuals under the rest treatment or sending them to sanatoria. Upon careful inquiry it may many times be ascertained that such individuals long ago had such treatment and profited by it.

In other cases the disease is insidiously advancing in spite of lack of symptoms and the patient may be a carrier and distributor of germs in spite of apparently good health.

In the later stages of fibroid phthisis the picture may be so much that of chronic bronchitis and emphysema from other causes, that the physician is completely thrown off his guard. Area tuberculin testing of school children has led in many instances to an unsuspected adult as the cause of infection of a considerable group of contacts. Grandmothers on account of their close association with children are especially likely to be the guilty parties.

The most practical method of locating these unsuspected spreaders of disease seems to be to give the tuberculin test to large groups of children and then examine thoroughly all adult members of families in which reactors occur.

Other diseases characterized by fibrosis may have few symptoms for a long period. The importance of physical examinations at intervals is evident.

REFERENCES

1. Baitsell, G. A., and Mason, Karl E.: The origin of the fibrous tissue arising in the testis of the guinea pig following experimental tuberculosis. Am. Rev. Tuberc., 21:593, 1930.
2. Sergent, E.: Les sequelles respiratoires des intoxications par les gas de combat. Presse Med., 13: 201 (Feb. 14), 1925. Abstract in Am. Rev. Tuberc., 14:35, 1926.
3. Castellani, A.: Notes on certain broncho-mycoses which may simulate pulmonary tuberculosis. Am. Rev. Tuberc., 16:541, 1927.
4. Sayers, R. R., and Meriwether, F. V.: Miliary lung disease due to unknown cause. Nat. Tuberc. Assn., Memphis, Tenn., May, 1930.
5. Evans, Newton, and Ball, H. A.: Coccidioidal granuloma; Analysis of fifty cases. Jour. Am. Med. Assn., 93:1881, 1929.
6. Miller, J. A., and Jones, O. R.: Primary carcinoma of the lungs. Am. Rev. Tuberc., 21:1, 1930.

CAUSES OF DEATH FROM ACUTE APPENDICITIS*

Archibald L. McDonald, A.B., M.D., F.A.C.S.
Duluth, Minnesota

TWENTY-FIVE thousand persons die each year from acute appendicitis, according to figures from the Bureau of Vital Statistics. This exceeds the number caused by ectopic pregnancy, pyosalpinx, gall-stones, pancreatitis, splenic and thyroid disease, combined. It is fifty years since Reginald Fitz published his classic description of acute appendicitis, and surgical treatment was seriously proposed. Since then countless studies have been published, and it would seem that ideas on the subject have been well crystallized. However, statistics quoted by Quain[1] and by Sivertson[2] indicate that the death-rate from this cause has increased during the last decade. This in contrast to experience with other surgical conditions.

The present study is based upon the records of the fatal cases of acute appendicitis which occurred during the past five years at St. Mary's and St. Luke's Hospital in Duluth. Its purpose is to determine, as accurately as possible, the factors which contributed to the outcome; and to discuss means by which these might have been avoided or more successfully attacked. Seventy cases are included, twenty-five of which came to autopsy.

Table I

	Total Cases	Deaths	Per Cent
Surgical Cases	32,954	724	2.3
Acute Appendicitis	1,574	70	4.5
Percentage of Total	4.7	10	

These figures show that ten per cent of the surgical deaths were due to acute appendicitis, a condition which accounted for less than 5 per cent of surgical patients admitted to the two hospitals.

Except for the fatal cases, the records of the hospitals do not permit division of the 1,574 cases into those limited to the appendix and requiring no drainage, and those with some degree of peritonitis or local abscess formation. For the purpose of this study I have developed tables, using the percentages given by Quain and by Wallace.[3]

Of the seventy fatal cases, the notes indicate that in seven the process was limited to the appendix and in only two was there any evidence of peritonitis or sepsis during the post-operative period or at autopsy. Of these seven, three involved elective interval appendectomy and probably should not be included in this report. Death was due to extraneous causes as follows: (1) sudden syncope on the tenth day, clinically a pulmonary embolus; (2) hemiplegia in a man fifty-two years of age after 10 days of normal convalescence, together with severe bronchitis; (3) late post-operative pneumonia with empyema in a woman aged twenty-three, following an elective operation for a mild subacute attack, and death eight weeks following operation. The remaining four cases were operated upon early in an acute attack. Two presented serious complications which were important factors in causing death. One of these, a diabetic girl of seventeen, fairly well controlled by diet and insulin, developed a severe cold, then an acute abdomen with collapse so severe as to suggest acute pancreatitis or ruptured gastric ulcer, and required immediate surgical intervention. A gangrenous appendix was removed under ethylene anesthesia. In spite of active post-operative treatment with glucose and insulin the patient went into coma on the third day, developed edema of the lung and died. Autopsy was negative except for an acute edema of the lung and absence of the islands of Langerhans. The other, an acute alcoholic, aged fifty-seven, suffered a sudden attack and came to operation within twenty-four hours. Post-operative delirium and marked distention appeared and the patient died on the fifth day. In the other two cases death was frankly due to peritonitis and sepsis. One, with post-operative paralytic ileus and late enterostomy, died on the sixth day. Autopsy disclosed generalized streptococcus peritonitis. In the other, the wound broke down on the tenth day with a fecal fistula, fever persisted throughout, and death occurred on the sixteenth day. Autopsy disclosed a pelvic, and also a perirenal abscess. It is probable that both of these should have received immediate drainage, and one of them an early enterostomy.

---

*Read before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 15, 1930.

TABLE II

	LOCALIZED				PERITONITIS					
			Mortality				Mortality		TOTAL	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	Deaths No.	Per Cent
Quain 1,000	551	55.1	2.	0.36	449	44.9	25	5.5	27	2.7
Wallace 600	398	66.3	2.	0.5	202	33.7	11	5.4	13	2.1
Total 1,600	949	59.	4.	0.42	651	40.7	36	5.5	40	2.5
DULUTH 1,574	944	59.	7.	0.74	630	40.	63	10.	70	4.4

Of these seven deaths, three were really late interval operations, of which two were embolic and one was due to late post-operative pneumonia. Two were due to known independent concomitant disease as the chief factor, and two were due to ileus and sepsis, and should have had more extensive primary operation.

On the basis of comparative figures, if the entire series of sixty-three late cases could have been brought to operation before extensive disease had developed, but five deaths would have resulted insteady of sixty-three, or a total of 12 for the 1,574 cases instead of 70. Therefore, the most important cause of death was late surgical intervention. We find four reasons for this:

1. The rapid course of the disease. Active peritonitis was found at primary operation in twelve cases within twenty-four hours of onset, and in eight others within forty-eight.

2. Failure to make a prompt diagnosis. Eight patients had been under medical care for more than twenty-four hours before a diagnosis was made and operation offered. Several of these apparently advanced to active peritonitis while under observation. We must ever keep the facts before us; the disease is frequently virulent and rapidly progressive, and as yet we have no fixed or positive evidence to identify these cases. Immediate operation as an emergency is the only justifiable course, certainly in the early cases, provided due consideration is given to possible complications or concomitant disease.

3. Failure to seek medical attention. Twenty-eight of these patients had been ill with suggestive symptoms for from three to ten days before calling a doctor. Twelve were known to have received cathartics. All were markedly septic when coming to operation. Surely the public is in need of education on this important subject.

4. Surgical intervention was delayed in six cases after the diagnosis had been established, twice, at least, justifiably. However, in only one instance was a well planned expectant treatment followed. While such a course is advocated by some experienced men for a certain group of cases with active or the "forbidding peritonitis" of Deaver, the Crile-Ochsner-Murphy plan of treatment must be rigidly followed.

Of the sixty-three fatal cases with peritonitis at the time of operation, the predominating causes of death are classified: (1) cardio-vascular—two; (2) pulmonary—twelve; (3) sepsis, including ileus—forty-nine.

The two cardiovascular deaths were as follows: A man, aged fifty-two, had been ill for six days before undergoing appendectomy with drainage. On the seventh day of satisfactory convalescence, he presented the clinical picture of an embolus and died suddenly. There was no autopsy. A man, aged sixty-nine, had an appendectomy with drainage on the second day of his illness, had a satisfactory convalescence till the fifth day, when he had a hemiplegia and died. Autopsy demonstrated cerebral thrombosis.

Of the twelve deaths with predominating pulmonary symptoms, three were embolic in origin, three presented evidence of pulmonary lesion before operation, and six developed late post-operative pneumonia. The embolic cases occurred on the fourth, sixth and seventh days of convalescence. One developed sudden collapse with pulmonary edema, and the other two were proven at autopsy. One of the latter also had a large retrocecal abscess which had not been reached by drainage. Three patients presented unmistakable evidence of pulmonary lesion previous to operation. One was unrecognized and was subjected to ether anesthesia for a prolonged operation of seventy-five minutes for appendectomy and drainage. Pneumonia was diagnosed the next day and death occurred on the second post-operative day. Another received a short chloroform anesthesia because of suspicious lung findings, developed bronchopneumonia and died on the third day. A third patient was explored and drained under local anesthesia during the course of a known pneumonia. Death occurred the next day and no autopsy was permitted. Three other patients developed pneumonia within forty-eight hours of operation, which lasted from forty to seventy-five minutes with ether anesthesia, which may have been a direct cause of the complication. The other three occurred later, following operation in cases which were heavily prostrated with sepsis and peritonitis. These may have been metastatic or asthenic.

More care in pre-operative study, selection of anesthetic, and protection during and after operation, would have prevented some of these deaths. Local or spinal anesthesia, better planning of operative procedures, early use of the oxygen tent, and proper post-operative protection must be given serious attention.

The remaining forty-nine patients died because of direct effects of the disease, namely: ileus or peritonitis with sepsis. Three were hopelessly toxic and obviously overwhelmed by infection when admitted to the hospital. Fairly well conducted expectant treatment was carried out in one instance for two days in an effort to secure some degree of improvement. Then under spinal anesthesia, drainage was attempted, resulting in death on the table. Another patient, who had been ill for a week, came in moribund, was operated on at once under local anesthesia for drainage and died on the table. A third individual, who had been sick for six days, was subjected to sixty minutes of ether anesthesia for appendectomy and drainage, and died a few hours later. These deaths seem to have been inevitable, but better pre-operative study and judgment would have averted ill-advised operative attempts.

Ileus was an outstanding feature in fourteen of the cases, though peritonitis and sepsis, to a marked degree, were also present in all. Five of these patients, previous to operation, presented such marked distention as to suggest the presence of ileus. In fact, in two instances, the pre-operative diagnosis was given as "intestinal obstruction." Primary ileostomy in addition to appendectomy and drainage was done in both of these, and also in another of this subdivision. The other two patients were badly distended previous to operation. This together with other evidence of ileus persisted till death. While early enterostomy is advised in all cases of ileus, the results are not as promising in cases associated with or due to extensive peritonitis.

One patient developed strangulation of an inguinal hernia on the sixth day following removal of a gangrenous appendix and drainage. Under spinal anesthesia, the hernia was reduced and repaired, and high enterostomy performed, but death occurred twenty-four hours later.

Eight other patients with extensive peritonitis and severe sepsis, also presented marked evidence of ileus, namely: paralysis of the intestinal tract, progressively increasing distention, persistent emesis finally fecal in type, and in three instances bloody discharge from the wound. In two cases enterostomy was done, rather late and without effect. In the usual case of post-operative paralytic ileus, early enterostomy is a valuable procedure. In certain instances of acute appendicitis with beginning ileus, primary enterostomy is indicated, and is often a life saving measure. It adds no burden to convalescence. To be of value it must be done before the gut is entirely paralyzed. In cases far advanced with peritonitis and sepsis, but little benefit can be expected, since peristalsis is no longer present or indeed possible.

In thirty-two cases peritonitis and sepsis must be accepted as the cause of death. It was an important contributing factor in those with ileus and with pulmonary complications. In nine instances, local or generalized peritonitis was drained without removal of the appendix, though in several much valuable time was expended attempting to do a complete operation. In ten cases the notes indicate some degree of localization of peritonitis at the primary operation. In all of these, the process continued to extend. In four instances autopsy disclosed localized abscesses which had not been reached by drainage.

Consideration of this entire group of extensive cases brings out several important questions:

1. That of immediate operation or expectant treatment. In this series there are a number of records which indicate that operation did little to control or limit the septic process, if indeed it did not actually hasten its extension. We must learn to recognize "the forbidding peritonitis" as recently re-described by Deaver.[4] This may be local or general and there is undoubtedly a stage of the process where operative manipulation is likely to do more harm than good. We must study again the classic descriptions of Murphy, Ochsner and Crile, and learn how, in certain carefully selected cases, we can best assist nature to localize and control the inflammatory process. In these, drainage is delayed till a carefully chosen time and then is a simple procedure.

2. Pre-operative preparation. While we recognize the fact that acute appendicitis calls for emergency operation, this is not necessarily true for acute peritonitis. We are forced to the conclusion that several of these patients were subjected to prolonged operation without adequate preparation. Certainly, some delay to overcome shock of travel, prostration, dehydration, if not to secure localization, would have contributed to a more successful outcome.

3. Prolonged anesthesia is always depressing, especially in the presence of sepsis. Yet most of these patients were given ether, or ethylene with ether, for from forty to ninety minutes, which certainly added materially to the operative burden. Local anesthesia, or local, reinforced by nitrous oxide to permit of a short well conducted operation would be preferable. Spinal anesthesia offers ideal facilities for all proper operative procedures, with no serious contraindication except prostration in presence of severe sepsis.

4. Operative technic. This is impossible to judge fairly from the notes in the hospital records. One derives the impression, however, that in most of the cases there was too much manipulation, too little protection of uncontaminated peritoneum, and too much time and energy expended in removing a deep-seated appendix. Also that in many instances more mature experience would have spared the patient much danger.

5. Drainage. Our observations from this standpoint bring out the fact that the classic studies of Yates, Blake, Coffey, and many others have need to be studied again, and again, and again. Too many operators still believe that free fluid, or even free purulent fluid, necessarily means infection of the entire peritoneum, and make no effort to wall off the truly septic area. In spite of all the published proof to the contrary they still have a childlike faith in the capabilities of two or three cigarette or gutta-percha drains as a means of relieving generalized peritonitis. Some of us must materially revise our ideas on this question.

6. Post-operative care given these patients is only sketchily outlined in the notes. It is quite apparent that many fail to appreciate the fact that operation is only one step in treatment. Some attempt to do too much, many do little or nothing. Few, however, have followed out a well organized plan conducive to localization of the septic process, overcoming shock and acidosis, and preventing ileus.

CONCLUSION

There is no classic picture of acute appendicitis which will fit any large number of cases. As physicians, we must appreciate the dangers of procrastination. Prompt diagnosis, careful attention to possible complications, and immediate appendectomy is the only safe course. It is the major hope of materially reducing the heavy mortality of this disease. There is need of a campaign of education for physician and layman bringing out the terrific dangers of delay. The so-called late cases often occur surprisingly early in the course of the disease. Proper management calls for a high degree of mature clinical judgment, and wide experience in operative procedure. Study of the operative notes and results force one to the conclusion that all of us have need to revise our ideas concerning treatment and drainage of appendiceal peritonitis.

REFERENCES

1. Quain, E. P., and Waldschmidt: Acute appendicitis, Arch. Surg. (April), 1928.
2. Sivertson, Ivar: Acute suppurative appendicitis: Factors in mortality, Minn. Med. (August), 1927.
3. Wallace, H. K.: Acute appendicitis. Proc. Western Surg. Assn., 1925.
4. Deaver, J. B.: Appendiceal peritonitis. Surg., Gyn. and Obst. (September), 1928.
5. Powell, Cuthbert: Drainage of the peritoneal cavity. Proc. Western Surg. Assn., 1922.

THE PROSTATE IN A GENERAL EXAMINATION*

A. E. Sohmer, M.D.
Mankato, Minnesota

The routine general health examination as a prophylactic measure has been emphasized in recent years, and rightly so, in all medical bodies, as well as in public lectures and writings to the laity. Likewise, in the regular examination of every new sick patient, it is proper to make a reasonably thorough survey of the condition or functional capacity of the various organs and systems of the body. The extent of this examination depends somewhat on the object in view, and as the case develops there will be suggested the direction of these inquiries.

The Old Line Life Insurance examination, as the result of actuary statistics, has been standardized, covering quite well the history and the physical examination of the various important systems of the body, and might well be taken as a model on which to plan an examination—details to be worked out according to the findings in each case.

In a life insurance examination, answering the prescribed questions usually satisfies the company. In private work we usually go further, especially if obscure symptoms are in evidence, inquiring into the status of more obscure organs, because the private patient is interested not only in life but in comfort and well-being.

I wish, at this time, to call attention to the prostate gland as a source of disease, and one which is apt to be slighted in the routine of a physical examination. Every male patient who comes up for examination should have a rectal examination to determine palpable rectal pathology, and the condition of the seminal vesicles and the prostate gland—especially chronic prostatitis and the obstructing prostate.

When one mentions chronic prostatitis, the thought comes at once of a venereal disease, past or present; but this is not necessarily so, since a great proportion of cases are non-venereal, the prevailing bacteria being streptococci or staphylococci, rather than gonococci. It is true that gonorrheal prostatitis is quite prevalent and usually becomes a mixed infection in due time; but there is a class of cases of chronic infection of the prostate due to non-venereal origin, to which I would like to call attention at this time. It may be the cause of painful joints or muscles and ligaments, or an iritis, or an exhaustion syndrome with anemia, in the advanced case.

The infection in the prostate may be secondary to tonsillar or dental infection and is transmitted through the blood stream—remaining in the prostate as a latent focus, from which it infects distant joints or organs. This spread from the prostate is usually intermittent, being activated by a lowered resistance or by local irritation. Such a condition may exist for years. When discovered, and treatment is begun, the distal symptoms are often temporarily aggravated—just as the removal of a chronic infected tooth will make a person temporarily worse; this result can be of diagnostic importance. We may have a bacterial prostatitis without the presence of pus in the secretion, yet enough to cause distinct symptoms; in fact, until pus appears, the symptoms may continue. To determine such bacterial prostatitis, repeated massage after irrigating the urethra is required.

Von Lackum, who made intensive studies of this condition at the Mayo Clinic, found that approximately one-half of the cases of prostatitis under his observation were due to dental or tonsillar infection, and other distant foci. He found the most frequent organisms present were: the streptococcus in 35 per cent, staphylococcus 22 per cent, with about one-third of the cultures sterile.

One should always consider the prostate as a possible focus of infection in arthritis, neuralgia, iritis and general debility, even though there are no typical genito-urinary symptoms present.

How can this state of the gland be determined? First by palpation. Often the gland is firm, edematous, and enlarged. It may be of a hardness suggesting malignancy, or it may be soft and flabby. One must gently but thoroughly massage such a gland and catch the prostatic fluid expressed through the urethra. This should be examined microscopically for pus, red blood cells and bacteria. If the gland is under suspicion and one does not get an increase of pus cells, then a provocative injection of a mild silver nitrate solution should be made, and the massage repeated a couple of days later. One may then find an increase of pus cells with bacteria, which were absent at the first test. Sometimes repeated massage must be made to determine the extent of the infection present; most cases will show pus cells at the first examination, however. A clearing up of symptoms during treatment will show the probable causative relation between the two. It is surprising in many cases of this type of chronic prostatic infection how prompt and far-reaching may be the result of treatment. Patients who for years were unable to turn in bed or to stoop, will find prompt relief; patients who have been bedridden for months and even years, because of arthritic changes, may be made to walk and again become economically independent; patients mistakenly labeled as psycho-neurotics have been returned to useful, normal life by attention to a diseased chronic prostate. It is not our purpose to go into further details as to treatment, but only to call attention to such an entity of disease for which we should be on the lookout in any routine examination; on the other hand, we should not make a fetish of the prostate, nor ever neglect proper differential diagnosis.

---

*Read before the Southern Minnesota Medical Association, Mankato, Minnesota, August 25, 1930.

The other prostatic condition which should never be overlooked in a general examination, is that of hypertrophy or obstruction, whether due to adenoma, carcinoma, or an inflammatory condition. The examining finger in the rectum will often determine this, or a history of frequency, especially if nycturia is present, difficulty in voiding, and residual urine; 100 c.c. of residual urine is always an indication of a serious condition present, or threatening. One should differentiate the possible underlying causes, so as to institute proper treatment before serious vascular or renal damage is done.

Removal of the obstruction before serious damage is done, quickly returns a patient to a comfortable and useful life. Neglect of early diagnosis and proper treatment, on the other hand, is what develops morbidity and mortality. Residual urine is at once an indication for a blood chemistry to determine the functional capacity, or possible degenerative process going on in the kidneys.

Examination of eye-grounds for certain retinal vascular changes may reveal evidence of cardiovascular renal disease; a chemically normal urine, under such circumstances, would be suggestive of obstruction, rather than primary nephritis. The story is told of an oculist, who during routine examination of a patient's eye-grounds, made a diagnosis of hypertrophied prostate, the urine being practically normal to routine laboratory tests, but the characteristic retinal changes of renal degenerative damage being found. Looking into a patient's eyes and telling him he has a large prostate may be rather startling to the patient, and seem like a trick diagnosis, but can be explained by a logical sequence of physiological pathology.

If an obstructive condition is present in the bladder neck, one must determine the nature of the obstruction. This requires urethroscopy and cystoscopy. While this is in the province of the specialist, yet every practitioner should know of the methods required to arrive at a proper differential diagnosis in order to outline a method of procedure to the patient.

A patient of advanced age with nausea and vomiting may have uremia due to degenerative changes following bladder obstruction. Loss of weight and anemia may give the impression of gastric malignancy in this picture, and should be differentiated.

A cystogram often gives a clue as to bladder deformity or ureteral stasis and dilatation; a blood chemistry tells us how much retention there is of substances which should be eliminated normally; while the estimation of phenolsulphonephthalein gives a clue as to the renal capacity for excretion.

Thus early recognition of an enlarged obstructing prostate and prevention of infection of the bladder and secondary pyelonephritis with renal degeneration is worth while. It is more important to recognize the presence of a benign prostatic tumor than a malignant one, because there is a chance to help the patient with the former, and usually not with the latter case.

In conclusion, while it is not the purpose of this communication to go into detailed discussion of differential diagnosis, nor to discuss the treatment of these two conditions, namely, chronic prostatitis of non-venereal origin, and obstructing adenoma of the prostate, yet it is our wish to emphatically call attention to these two conditions in all routine examinations of adult male patients. Elaborate paraphernalia are not required, but a digital examination of the rectum can always be made and will rather frequently lead to an early diagnosis at a time when it will benefit the patient.

ACUTE DILATATION OF THE STOMACH*

James Morrow, M.D.
Austin, Minnesota

EVERY abdominal operation, and probably most other operations, where there has been either direct or indirect stimulation of visceral afferent nerves is followed by varying degrees of gastric relaxation. It is true of any condition, that the more we are interested in it, the more prone we are to recognize its beginnings and to become more watchful for its occurrence and its course. Gastric relaxation therefore may be present, but unless it should progress to a point of acute dilatation of the stomach, might not be recognized; but, the dilatation having occurred, a vivid picture presents itself. Yet no one cause alone will produce this picture; an anesthesia may or may not have been a predisposing cause: reflex stimulation may be aggravated by mechanical obstruction, and yet the risk is so great that we feel that it may well be worth while to consider this condition.

Two views are held as to the causation of acute dilatation of the stomach: either a marked inhibition of the vagus or an over-stimulation of the sympathetic, or strangulation or compression of the duodenum. The weight of both experimental and clinical evidence favors the first theory. It is not an uncommon occurrence to note relaxation of the gastric walls during the laparotomies when viscera are handled, such relaxation being due to a reflex nervous stimulation.

Experimentally, however, section of both vagus nerves above the diaphragm has not produced an acute dilatation with adverse symptoms, though relaxation of the stomach walls has occurred. The loss of tonus in the gastric musculature, regardless of its cause, will be the predominating factor. There is sufficient evidence to show that both ether and chloroform anesthesia reduce gastric tonus, and this must be considered as a contributing factor.

The question of an associated obstruction to the duodenum is distinctly a matter of controversy. It should be considered as a result of the dilatation and not a causative factor. Obstruction of the duodenum will not of itself produce an acutely dilated stomach. It is true that at postmortem examinations, in nearly every case of dilated stomach, some obstruction of the duodenum will be found. But careful examination will show that the degree is not sufficient to be a causative factor of the dilatation. For a very small degree of duodenal occlusion may produce a rapidly fatal toxemia; even an obstructive condition in the jejunum or ileum which will produce no symptoms, may, in the same degree in the duodenum, be fatal. This can be explained by the fact that the duodenum is capable of practically no distention and the fact that its nutrient vessels are arranged parallel to the long axis and that any degree of distention may result in an immediate circulatory damage.

The consensus of experimental and clinical evidence would therefore be that, in its etiology, an acute dilatation of the stomach would follow first a gastric relaxation and loss of tonus, reflex in origin, and that then a secondary mechanical occlusion of the duodenum follows either by direct pressure of the dilated stomach on the duodenum in its passage over the spine, or by an arterio-mesenteric compression brought about by the downward pressure of the dilated stomach. The important factor in the duodenal occlusion is the genesis of the toxic symptoms associated with this condition.

When the condition has actually developed, the symptoms are vividly present. As a rule, these symptoms do not present themselves till the third day, but even prior to then, certain consistent factors have been noticed which we feel are of importance. Even noticeable within twenty-four hours following operation, is the apprehension of the patient of a constant distress in the upper left quadrant. The pulse will increase even with a normal or subnormal temperature. There will be, with the use of enemata, passage of flatus from the bowel without relief of the upper abdominal distress. Examination at this time will show no fluctuation, but a marked tympanitic note may be observed over a large area of the upper abdomen. Passage of a stomach tube at this time will give immediate relief, and the striking fact is that this primary distention is due, not to any fluid content of the stomach, but is due entirely to distention with gas. Only mild, if any, toxic symptoms, are present. In most cases, with judicial after-treatment, no recurrence of the symptoms will occur. In cases when these first observations cannot be made, and in those cases which progress even after the above treatment has been instigated, the symptoms are an enormous accumulation of fluid in the stomach and the toxic phenomena of prostration, dehydration and collapse.

---

*Read before the Southern Minnesota Medical Association, Mankato, Minnesota, August 25, 1930.

The enormous amount of fluid which the stomach contains is the most apparent feature. This amount, in one of our cases, was nearly seventeen liters in a twenty-four-hour period. Nearly three liters were obtained at one time in another case. These amounts were far in excess of the fluid intake. This fluid has as a rule no sour odor, is fairly clear and usually has a yellow tinge. In only one of the cases, as tabulated later, was there any free hydrochloric acid present, but bile was present in every case, and fecal material present only in one case. Probably this fluid contains also duodenal secretions and pancreatic juices. It is hard to conceive that this enormous amount of fluid can be the normal output of the gastric glands, and must be the result of a profound stimulation, which stimulation comes probably from a chemical basis brought about by substances produced as secretive bodies from the duodenal mucosa. Such an amount of fluid entering the stomach naturally results in a generalized dehydration, evidenced by scanty urine of high specific gravity, albumin and later the appearance of granular casts, and the further symptom of extreme thirst that the patient presents. The pulse grows more thready and rapid, and the picture in the case progressing fatally is one of collapse. Such symptoms, together with the distended abdomen more marked on the left, the prompt relief of this distention following gastric lavage, leaves no doubt as to the diagnosis.

Only rarely can the diagnosis be confused. Peritonitis and postoperative ileus are the two conditions stimulated, but the lack of fever, the lack of a varying leukocytosis, the fact that in peritonitis the abdomen presents a more generalized tenderness and rigidity and is more diffusely distended, and the usual lack of fecal vomiting should rule out a peritonitis. Postoperative ileus usually involves the small bowel further down in its course, is not as early in its onset, and pain is a more prominent feature. Moreover, neither of these conditions responds immediately, as does a dilated stomach, to gastric lavage or to postural treatment.

The occurrence of an acutely dilated stomach in a definite form has been observed by us during the last few years in ten cases. These are tabulated below as an indication of the variations in which it has developed. A fact that has impressed itself on us is that in no case of operation on the stomach itself did there develop an acute dilatation.

Of the fatal cases, the first was a cesarean section performed for an eclampsia. The toxic symptoms were most marked, and were surely aggravated by the pre-existing eclampsia. Death occurred on the seventh day. Autopsy showed only an enormously dilated stomach filling nearly the entire abdomen (gastric lavage five hours prior to death), with a thin stomach wall. A definite angulation in the upper right quadrant gave the resemblance of duodenal occlusion, but this occlusion could very readily be overcome by the finger passing through the pylorus and duo-

GASTRIC DILATATION*

Case Number	Operation	Anesthetic	Onset	Bile	Free HCl	Fecal Vomiting	Albuminuria	Casts	Outcome
1	Inguinal hernia	local infiltration	60 hours	X	O	O	X	O	recovery
2	Appendectomy	ether	48 hours	X	O	O	X	X	recovery
3	Cesarean section	ether	72 hours	X	O	O	X	X	death
4	Tetanus	none	8 days	X	O	O	X	X	recovery
5	Cholecystectomy	ether	60 hours	X	O	O	X	O	recovery
6	Appendectomy	ether and gas	12 hours	X	O	O	X	O	recovery
7	Intestinal obstruction	ether	72 hours	X	3%	X	X	X	death
8	Fractured femur (plaster cast)	ether	12 hours	X	O	O	X	O	recovery
9	Hysterectomy	Spinocain	60 hours	X	O	O	X	O	recovery
10	Lipoma (thigh)	Novocain and sod. iso-amytal	7 hours	X	O	O	X	X	recovery

---

*Cases from records of Drs. Leck and Morrow.

denum. The case of intestinal obstruction which terminated fatally might be considered only as an obstruction were it not for the enormous amounts of fluids evacuated from the stomach. Unfortunately no autopsy was allowed.

I have referred at various times to gastric lavage. It is hard for me to mention acute dilatation of the stomach without a nearly coincidental thought of lavage, for of all the remedies proposed for the relief of this condition, it has been the only one consistently beneficial. And it is our impression that it is repeated lavage, at regular four-hour intervals, that is the deciding factor in the ultimate outcome. While I distinctly advocate lavage as the most important therapeutic method, it does not mean that additional methods should not be employed. The elevation of the pelvis to reduce the downward pull of the overloaded stomach; knee-chest position if practical; the use of small doses of surgical pituitrin—are all to be employed. In combating the toxemia, nothing is more beneficial than intravenous injections of 500 c.c. of a normal saline solution every four hours (our procedure is to give the saline after every lavage). Not only is the dehydration lessened by these intravenous injections, but blood chlorides are restored to the circulation, and a suppression of urine is guarded against.

The use of the duodenal tube in our experience has not been satisfactory. I think it probable that we do not get adequate duodenal drainage, because of the position of the stomach. Certainly there is not diminution in the toxic phenomena even though the duodenal tube is left in constantly, which shows that the toxic secretions are not withdrawn through the duodenal tube. Neither has the use of a small tube in the stomach, with constant syphonage, been as beneficial as active gastric lavage at regular intervals. While we have tried the procedure in only one case, there was absolutely no effect in relieving an acutely dilated stomach with the use of spinal anesthesia, though an intestinal non-mechanical obstruction can be frequently promptly relieved by this method. Surgery has no place in the relief of this condition, as a glance at mortality rates following surgical intervention will clearly show.

In conclusion, we may consider acute dilatation of the stomach an emergency condition demanding prompt and efficient treatment. Its occurrence may be anticipated at any time for it is not peculiar to any operation or to any anesthetic, and the reward of vigilance will be the lessening of what, up to recent years, has been an appalling mortality.

THYMOPHYSIN

Thymophysin is a foreign proprietary preparation of posterior pituitary and thymus claimed to be an oxytocic to accelerate normal delivery. In German periodicals, many articles have appeared praising the virtues of this mixture for use in the first and second stages of labor. Even in America a number of favorable but uncritical articles have been published. Erwin E. Nelson, of the University of Michigan, has reviewed the literature and carried out experimental investigations. He points out that the literature reveals no controlled evidence that the oxytocic or pressor activities of pituitary is altered by the addition of thymus extract. From his experimental work it appeared that, in this country at least, Thymophysin is incorrectly labeled as to its strength and no difference could be ascertained in the oxytocic or pressor activity of pituitary extract as compared with pituitary plus thymus extract. Nelson believes that the clinical results obtained from Thymophysin can be explained completely as due to small doses of pituitary extract. Thymophysin illustrates again the pitfalls awaiting those who are not thoroughly competent to undertake clinical evaluations but who arrive at conclusions based on the use of material the composition and activity of which have not first been scientifically determined. If physicians wish to undertake experimental clinical investigations with drugs, they will save time and protect the interest of the patient by limiting themselves to drugs whose chemistry and pharmacology have first been studied by the Council on Pharmacy and Chemistry. (Jour. A. M. A., January 31, 1931, p. 359.)

NON-MYXEDEMATOUS HYPOTHYROIDISM*

CHARLES N. HENSEL, M.D., F.A.C.P.
Saint Paul

TO those physicians living in the Great Lakes basin, diseases of the thyroid gland bulk large. That many individuals in this district suffer from an over-activity of the thyroid gland—hyperthyroidism—a voluminious literature and numerous "collar scars" amply testify. That there are many individuals in this district not obviously affected by under-activity of the thyroid gland—hypothyroidism—is not generally recognized. Unless an individual presents myxedematous changes in the skin and subcutaneous tissues with mental and physical torpor and increased body weight, hypothyroidism is seldom suspected. That there may be under-functioning of the thyroid gland without any of the above signs, will be a surprise to many physicians—because the belief still exists that under-functioning of the thyroid gland and the myxedematous syndrome are synonymous.

This is not strange when we realize how we have acquired our knowledge of myxedema. In the year 1875, Wm. Gull reported five cases, "characterized by swelling of the skin, and more or less complete apathy"—under the title "A cretinoid state supervening in the adult life of woman."

In 1877, Wm. Ord published six cases which he called "myxedema" on account of the edematous infiltration of the skin. In 1877—the same year—Charcot published similar cases which he designated as "cachexia pachydermique." In 1880, Savage reported on the first case of myxedema in the male. In 1880, Madden noted that in the myxedematous state atrophy of the thyroid gland was constantly present, but drew no deductions from this analogy.

About the same time, Kocher, of Berne, and Reverdin, of Geneva, independently reported on results following the total removal of the thyroid gland for goiter. They found a syndrome similar to that described by Gull and Ord, but surgically produced, and Kocher designated the condition, "cachexia strumiprevia." In 1884, an English commission appointed to study the etiology of myxedema, concluded that the only lesion constantly found in the disease was thyroid atrophy. "Without lesions or absence of the thyroid gland—no myxedema," said Kocher. Since that date myxedema and hypothyroidism have become synonymous and the belief is still general that you cannot have hypothyroidism without the myxedematous syndrome. But remember that myxedema is not a disease, but merely a sign in the skin and subcutaneous tissues as a result of hypothyroid function.

This sign was described in its relation to thyroid atrophy before we had any knowledge of direct or indirect metabolimetry. Since the perfection of indirect metabolimetry, hypothyroid states have been encountered as evidenced by reduced metabolic rates but without signs of myxedema.

At first physicians paid no attention to these low rates because no infiltration of the skin was present, but gradually it came to be recognized that, just as with kidney disease, there could be reduced kidney function without edema, so there could be thyroid disease—thyroid insufficiency without myxedema. Under this influence a budding literature is slowly growing up in which the condition under discussion is cautiously referred to as masked or occult hypothyroidism, mild hypothyroidism, small hypothyroidism, larval hypothyroidism, etc.

This caution obviously exists because the symptoms are largely subjective and the main reliance must be placed on the symptoms, plus lowered basal metabolic rates and response to thyroid opotherapy. These writers recognize the dangers of such types of diagnosis, especially in this day of ultra-scientific medicine when the clinical art ranks less than the laboratory science, in diagnosis and treatment.

Mention is made of hypopituitarism in which there is a somewhat lowered basal metabolic rate, asthenia, prolongation of the menstrual interval and sometimes urinary changes of hypo-suprarenalism with its intermittent asthenia, vasomotor instability, tremors, hypotension and failure to respond adequately to thyroid therapy.

If we can bear these two possibilities in mind and recall that they are relatively uncommon

---

*Read before the Southern Minnesota Medical Association, Mankato, August 25, 1930.

(about 15 per cent each, in a large series of cases), then we can keep our feet on the ground, tentatively diagnose non-myxedematous hypothyroid states from the symptoms, confirm the diagnosis by the reduced metabolism and clinch the diagnosis by the response to treatment.

Etiology.—Infections seem to play an important role. Roger and Garnier, in 1900, examined critically the thyroid gland in forty patients, dead of various infectious diseases, namely, measles, scarlet fever, diphtheria, small-pox, acute gastroenteritis, typhoid fever, cerebro-spinal meningitis and peritonitis. In nearly every case they found histological changes, such as diffuse hemorrhage, epithelial proliferation, swollen cellular protoplasm, poorly stained, cellular desquamation, with colloid thin or absent but very little change in the interstitial connective tissue. Quite obviously the infectious process had its chief effect on the secretive portion of the gland and their conclusions were that "infectious processes (after a period of functional stimulation leading to hyperthyroid symptoms) injured the thyroid gland and might eventually produce a more or less complete functional inhibition—hence hypothyroidism."

They postulate the fact that certain individuals have barely enough thyroid secretion to meet the ordinary physiological demands, but that as soon as their gland is overtaxed either through strain or by the toxins of infection, hypothyroidism develops.

Hypothyroid symptoms may occur at any time in life but are particularly common at certain ages and under certain conditions, namely, at puberty, at the menopause, during and following pregnancy, in the convalescent period following infectious diseases (notably influenza), and occasionally following extensive thyroidectomy for large degenerating adenomatous goiters.

Symptomatology.—The symptoms are bizarre. The chief outstanding complaint is fatigability, lack of "pep," no endurance, being tired all the time. These patients find it difficult to keep up with their daily tasks without becoming "all in." A night's sleep does not refresh them, they awaken tired in the morning, may work up towards a peak of energy sometime through the day, but this does not hold and their energy sags by night.

Some complain of daytime drowsiness; others, due to lack of energy, become mentally depressed. They suffer at times from severe headaches, hard to relieve by anything but rest, and are prone to generalized indefinite bodily aches and pains. Constipation may be extreme, menstruation may be excessive, and there may be lack of sex urge and sterility. Many note sensitiveness to cold, need extra bedclothes at night though they want plenty of fresh air in the room, want the temperature of the house 76 to 78 degrees and constantly have cold hands and feet.

None complain of dry skin or thinning of the hair; in fact in some of the most outstanding cases the skin is very fine, white and elastic. There is no constant physical type—all statures and body weights were represented. Out of fifty-six cases recently collected, twenty-four were of the lean slender type definitely below normal in weight, twenty-two were of normal weight and ten were over-weight. This point should be stressed, as the impression is current that hypothyroidism does not occur in thin people.

Physical Signs.—The general physical examination of these patients usually reveals very little. Many of them are alert mentally,—executives, salesmanagers, school teachers, students. Some show moderate swelling of the thyroid gland. In others a very small gland is just barely palpable or no gland at all can be felt. The pulse is usually slow (56 to 72), and the heart tones are frequently feeble or faint and distant with an occasional soft circumscribed systolic murmur over the apex.

Blood pressures are usually reduced from 116 systolic to 98 to 95 systolic, with diastolics between 80 and 60. Occasionally a patient will be below weight, show a swelling of the thyroid and have a tremor and an accelerated pulse, suggesting a possible hyperthyroidism. The blood may show a mild chlorotic anemia, but this is not at all characteristic. In fact, there are no symptoms entirely characteristic of hypothyroidism.

The one outstanding complaint is invariably undue fatigability. The one constant finding is a lowered metabolic rate. There is a wide range of variability in the degree of reduction of the metabolic rates, the readings ranging from minus 13 to minus 33 per cent, but showing no correlation between the degree of reduction and the intensity of the symptoms.

It was thought, following the postulates of Fahr in his cases of myxedema, which showed narrow Q.R.S. complexes and flattened T waves, that the electrocardiogram might serve as an additional differential diagnostic aid, but all my cases showed only the normal variants in cardiographic architecture, the Q.R.S. complexes being of good height and the T waves normal—occasionally high.

Differential Diagnosis.—When a patient complains of undue fatigability for months or years, headaches, generalized muscular pains, possibly constipation and susceptibility to cold, yet does not look particularly sick, is on a normal diet and yet does not gain weight but may even be thin, and on physical examination little else can be found but a slow pulse, low blood pressure, subnormal temperature and occult tuberculosis and cancer can be ruled out, and his basal metabolic rate is minus 10 per cent, or lower, and we can rule out hypopituitarism and hyposuprarenalism, then I think we are justified in making a diagnosis of non-myxedematous hypothyroidism and instituting treatment with thyroid gland substance or desiccated extract.

Treatment.—Treatment should be begun with small doses of thyroid gland to try out the patient's tolerance and to slowly raise the metabolism, remembering that the thyroid gland is a regulator of combustion in the body and with increased activity there is an increased combustion and possibly an accumulation of waste products faster than they can be eliminated. This may result in headache and general malaise. Also the thyroid increases the work of the heart more rapidly than its tone, so that sometimes pain and insufficiency develop. This is especially true if the patient is elderly.

If you use the dried fresh gland, the maintenance dose is on the average from three to five grains daily, while if you use the desiccated extract, the dosage is less, being one to two grains daily. Get to know one preparation and what it will do and stick to that brand and check the patient's metabolism at frequent intervals until you have found the proper maintenance dose that keeps him up to normal efficiency without producing symptoms of thyroidism. The thin hypothyroid will gain weight and the obese hypothyroid will lose weight, owing to the tendency of normal thyroid secretion to normalize metabolism.

At times it seems that following an acute respiratory infection such as bronchitis or influenza or tonsillitis, the hypothyroid patient on thyroid therapy may not show a normal convalescence, but may exhibit again signs of his original hypothyroid state to a moderate degree. Recheck of his metabolic rate will show an additional drop which necessitates, for the time being, an increased dosage of thyroid extract.

Therefore, it is important to watch these patients and check their metabolic rates from time to time. An occasional patient seems to have a regeneration of the thyroid gland under treatment and, ultimately, substitution therapy must be discontinued—otherwise thyroidism results. I have seen a female hypothyroid patient slightly overweight, in order to lose more weight, greatly increase on occasion the prescribed dose, of her own accord, producing thyroidism, namely, loss of weight, palpitation, nervousness, and insomnia. These symptoms have invariably subsided on the withdrawal of the drug, with no evidences of permanent constitutional damage.

I have watched all my patients on thyroid medication very carefully and so far have not had one develop goiter or signs of toxicity other than the one case above described.

BIBLIOGRAPHY

1. Bridges: Med. Clinics N. A., Sept., 1928.
2. Cole and Womak: Jour. A. M. A., Feb. 9, 1929.
3. Crotti: Thyroid and Thymus in 1922, p. 199.
4. Koehler, E. E.: Am. Clin. Med., Jan., 1927.
5. Koehler, A. E.: Trans. A. M. A. Practice med., p. 188.
6. Lawerence, C. H.: Med. Clinics N. A., May, 1925.
7. Lawerence, C. H.: Boston Med. and Surg. Jour.; January 13, 1927, Vol. 196, No. 2, p. 43, p. 377.
8. Lawerence and Rowe: Endocrinology, Vol. XII, No. 4, July-Aug., 1928, p. 773.
9. McKenzie, G. M.: Jour. A. M. A., 86-462-4, Feb. 13, 1926.
10. McLester, Jas.: Clinics N. A., March, 1929.
11. Warfield, L. M.: Am. Clin. Med., 1928.
12. Womak: Endocrinology, Vol. XII, No. 6, Nov.-Dec., 1928.

MEDICAL PIONEERS OF MINNESOTA*

William J. Mayo, M.D.
Rochester, Minnesota

DR. GEORGE E. DE SCHWEINITZ, the dean of American ophthalmologists, who was president of the American Medical Association in 1922-23, speaking of the advice which should be given to a young man starting out in life, said, "When I went away to college, my father saw me off at the train and said to me, 'George, I am not going to give you a lot of advice, but I want you to remember that you come from respectable people.'" The more one thinks about this brief counsel relative to the forming of character, the more one is impressed with its true significance.

We, who are here today, must be impressed with the fact that we are members of a respectable profession, made respectable by the pioneer physicians who have gone on before. In the early days medical men of courage and vision came to Minnesota with other valiant pioneers, to face the hardships of frontier life. The great test of courage in those who preceded us in Minnesota was contact with the most intelligent, the most courageous and the most warlike of the American Indians, the Sioux. Who here has not read the Leather Stocking Tales of Fenimore Cooper: The Last of the Mohicans, The Deerslayer, The Pathfinder? As a boy I always pictured these romantic stories in relation to the Minnesota Valley.

My father came to Minnesota in 1854. He was the medical officer with the Territorial Survey which laid out the northern counties of the state. When St. Louis County was surveyed, there were few inhabitants in that vast territory. At Rice Point, near where Duluth now stands, there was one cabin, but the trapper who lived there was away, and therefore Father was made temporary chairman of the first board of county commissioners, an office which he held for about six weeks, until someone who lived in the county could be found to take his place. In 1856 Father moved to Le Sueur, on the Minnesota River, the head of navigation, to practice his profession. At that time one little boat plied irregularly up and down between Le Sueur and St. Paul. When the Civil War broke out, Father was one of the United States Medical Examiners, and in 1862, when the great Indian outbreak took place, he was with the small detachment of soldiers and men who went to New Ulm to repel the Indians. They told the story afterward that during the siege Father had just completed an amputation of a leg for gangrene, when, looking out of the improvised operating room, he saw two of the undisciplined guards, who had been instructed to remain at a post of observation, sneaking back into the settlement. He started after them with the long amputating knife used in the early days, and turned them back to the line of duty.

With the men at the front, and only women and children left in Le Sueur, my mother organized the women to represent a company of soldiers. She dressed them in men's clothing and armed them with pitchforks, and fence pickets to the top of which knives, forks, spoons or bits of tin had been fastened, which would glitter in the light and look like bayonets, and several times a day marched them in military formation about the settlement. The Indians, who were massacring settlers in every direction, seeing Le Sueur from the hills, believed that soldiers had come up on the boat as a guard, and did not attack.

At the close of the Indian uprising, when thirty-nine Indians were hung at Mankato, Father secured the body of Cut Nose, a huge Indian who, in some predatory expedition, had received a cut with a tomahawk through the edge of the forehead and face which almost severed the nose. Father cleaned and articulated the skeleton, and on this skeleton, under his instruction, my brother and I, as small boys, learned our osteology.

Early in 1863 Father was sent to Rochester as United States Medical Provost-marshal to entrain troops. The railroad had just come to that vicinity.

I mention these incidents because of the influence that they had on my brother and me in fixing the Minnesota Valley in our youthful minds as a field of romantic adventure, and the romance of those early years remains with us to this day.

---

*Talk before the banquet of the Southern Minnesota Medical Association, Mankato, Minnesota, August 25, 1930.

The Minnesota State Medical Association was organized in 1869. My father was one of the founders and its third president. The Minnesota Valley Medical Association, which was next in size, was organized December 1, 1880, at Le Sueur. In the previous October a number of physicians of Le Sueur County had met at Le Sueur Center and had partially organized a medical association and named it the Minnesota Valley Medical Association. Dr. Otis Ayer, Le Sueur; Dr. C. F. Warner, Mankato; Dr. A. W. Daniels, St. Peter; Dr. Alfred Muller, New Ulm; Dr. G. F. Merritt, St. Peter; Dr. Z. G. Harrington and Dr. E. J. Davis, Mankato, with others, were members of this group.

Even while I was a student of medicine, I had the opportunity to attend with my father several meetings of the Minnesota Valley Medical Association, which were held yearly in Mankato, and there I had the privilege of seeing some of the medical pioneers. One of them in particular I can still see in my mental vision, Dr. Daniels of St. Peter, a cultured gentleman. It was inspiring to see a man of that type in pioneer surroundings. When on one occasion Dr. Daniels saw me at the meeting of the society with my father, he said, "So you are going to study medicine? Well, it is the most satisfactory of all the professions. It is doing for others. I have always been physically very well, and let me advise you that when you go into the practice of medicine and begin to go about the country seeing patients, be careful what you eat. I have found it wise to ask for a boiled egg, a baked potato, hot toast, and to drink tea or coffee, something that has been boiled and is still hot." Thus I learned from an observant man the knowledge that unclean food might be the cause of much sickness.

Dr. Alexander Stone, of St. Paul, was one of the finest speakers in the medical profession of the state of his time. Dr. Charles T. Wheaton, the surgical hero of my young professional life, a graduate of Harvard who had interned at the Boston City Hospital, was a very fine anatomist and a conscientious and most courageous surgeon.

Dr. James Dunn, of Shakopee, later of Minneapolis, and Professor of Surgery at the University of Minnesota, was the most learned surgeon of his time in the Northwest, I believe. He had spent two years in Germany. He used to come down to see us at Rochester, and he was always cold. We would always build a fire in the grate, and he would drop into a chair in front of the fire, resting apparently on the back of his neck, stretch out his long, thin legs to the blaze, and become reminiscent. On one of his trips back from New York, he stopped with us for a few days, as he often did. I was very much interested to know what of interest he had seen on his visit, and asked him. He said he had seen many things. "The funny thing about it is that when I get off and see things, I make up my mind that I am going to do them, and when I come home, I find myself sliding back into the old ways I have always used and have confidence in." He went on to say, "My wife and I go every year to New Hampshire to a lake where a farmer has some cottages. When we were younger, we enjoyed the rough living, but as we have grown older and more sophisticated, we should like more conveniences. We and some of the others who go to the lake regularly decided to take up a collection and send the old man away to see resorts elsewhere. We did not want to ask him to make changes for our benefit, but we thought if he saw what other places were doing, he would want to do the same. When he returned from his trip, we all met him at the boat. He got off full of enthusiasm. 'Boys, I have seen them all, Newport, Atlantic City, and, do you know, this is the only place they have seven different kinds of pie for breakfast?' "

I remember well Dr. N. S. Teft of Plainview, with dangling lower extremities, crippled by infantile paralysis, carrying his heavy body around on crutches, doing country practice. Nothing was allowed to interfere with his work. He would start off through the snow in winter, and if he did not return at a certain time the livery man would take a team and go to find him. Perhaps he would be in a snow drift; hardly able to blanket his horse, and waiting down under the robes for rescue.

The Southern Minnesota Medical Association was organized July 28, 1892, with a membership largely from the southeastern part of the state. Of the leaders in this group, I remember Dr. Franklin Staples and Dr. J. B. McGaughey of Winona, Dr. Charles Hill of Pine Island. Drs.

W. H. Lincoln and W. F. Milligan of Wabasha, and Drs. E. C. and E. W. Cross and W. W. Mayo of Rochester.

It was decided after many years of success that the Southern Minnesota Medical Association and the Minnesota Valley Medical Association should combine in order to extend the membership into the southwestern part of the state. This was done willingly, but nevertheless with great sorrow by the old pioneers of the Minnesota Valley Association.

It is to these pioneers that we owe the splendid position the Minnesota medical profession now occupies. Early in the 80's an enactment was brought through the Legislature which did much to keep out medical chaff from Minnesota. This law was fairly well enforced and has been improved on at various times, until today the Basic Science Act does much without prejudice to keep the profession of the state clean.

The pioneer medical profession of Minnesota, part and parcel, exemplified character and courage. Especially let me dwell on courage. Minnesota in three great wars, the Civil War, the Spanish-American War, and the Great War, organized and sent to Washington the first volunteer regiment and in each and all of these wars sent a larger percentage of volunteers in proportion to the population than any other state in the union.

Let us rise for a moment in silent homage to the medical pioneers who have made Minnesota so respectable a place in which to practice medicine.

RENTON'S HYDROCIN TABLETS

Under the name "Renton's Rheumatic Tablets" the Renton Company of Pasadena, California, put out an alleged rheumatism cure a year or so ago, under the claim: "What insulin is doing for diabetes, Renton's Rheumatic Tablets are doing for arthritis, neuritis and rheumatism." After the preparation had been on the market for some time, the officials at Washington in charge of the enforcement of the Food and Drugs Act are said to have made the Renton Company elimiinate the word "Rheumatic" from their labels and the nostrum became "Renton's Hydrocin Tablets." The A. M. A. Chemical Laboratory, reports that each Renton's Rheumatic Tablet was found to contain essentially 0.32 Gm. (approximately 5 grains) of cinchopen, with a relatively small amount of an unidentified amine. The Laboratory reports that qualitative tests indicated Renton's Hydrocin Tablets to contain the same ingredients as found in Renton's Rheumatic Tablets, and that the amino compound present was identified as a tetra-ethyl ammonium compound. Although the tablets were stated to be enteric coated, the Laboratory found that the coating flaked off when they were immersed in 0.2 per cent hydrochloric acid. Summed up, it appears that people who pay $1.50 for fifty Renton's Hydrocin Tablets are getting what is essentially fifty five-grain cinchopen tablets, which could be purchased at almost any drug store at half the price, and, what is of more importance, with the possibility of the dangers and limitations of the drug known. With the increasing number of cases of acute yellow atrophy of the liver following the continued use of cinchophen it seems little less than criminal that irresponsible "patent medicine" exploiters should continue to put this potent drug into their secret mixtures, with no warning as to the possible dangers in its continued use. Nor are the large and supposedly respectable pharmaceutical houses, which put up such formulas for "patent medicine" manufacturers, free from moral responsibility. (Jour. A. M. A., January 17, 1931, p. 209.)

THE ART OF MEDICINE*

Walter C. Alvarez, M.D.
Rochester, Minnesota

LOOKING back over the years can you not, every one of you here tonight, remember some of your classmates in college who were good students and who could turn in excellent examination papers but who, when they went out to practice, somehow or other failed to achieve what is commonly known as success. You will remember also some very poor students who perhaps flunked out and later succeeded in getting through a diploma mill and somehow past a state board and who are now staggering under the burden of an enormous practice.

Now it is true that some of the men who could not or would not study at college did buckle down when brought face to face with the needs of their patients, and they did learn something about the science of medicine and surgery, but this is not the explanation for the success of many of the others. I have met some of them in consultation and have always come away wondering how anyone could have been "exposed" to so large a mass of clinical material without learning something from it about the nature of disease. I remember once going with one of these men into a room where I needed but one look to tell me that the fat cyanotic ex-brewer who lay propped up in bed was in the last stages of terminal pneumonia. When I stepped into the next room and told my colleague what he was up against I was astounded to find that he hadn't even suspected that the lungs might be involved. In order to get a diagnosis he had sent some urine and blood to a commercial laboratory, and when the report came back that the man had nephritis, well, nephritis it was until the family became alarmed enough to ask for a consultation.

A remarkable practitioner.—I have often tried to analyze the reasons for the success of the most remarkable of all these poorly educated physicians whom I have known, a man who, while working some forty years ago as a barber, went for a few months to a third rate college and there attended some lectures. With this excellent scientific foundation, he hung out his shingle, and from then onward until a few years ago, when a stroke ended his career, he enjoyed what was probably the largest and most lucrative practice to be had in a certain large city of this land. The estate which he left was appraised, if I remember correctly, at well over a million dollars. I have several times met this man in consultation, and always on such occasions I have been surprised at his inability to read some of the plainest sign-posts of disease. Surely his success was not due to any skill in diagnosis. Well then, to what was it due? Most of you will doubtless expect me to say that it was due to the fact that he was a big, fine-looking, magnetic sort of man, well endowed with all that personal charm and that appearance of distinction which gives to certain men the prestige and power to command their fellows, to lead them, to influence them, and even to heal them.

No, that was not it. He was an insignificant looking little man, barely five feet tall, and quite devoid of any charm of manner that I could detect. So far as I could see his success was due largely to three factors: first, his clever use of consultants to make his diagnoses and to shoulder responsibility when things went wrong; second, an ability to work hard twenty hours out of the twenty-four; and third, and I think most important of all, a canny knowledge of human nature and of much of the art of medicine.

I have often wished that some of my younger confreres in the medical profession, those who by refusing to accept consultations insist on keeping for themselves all the obloquy that can come from the loss by death of a prominent patient, could learn the lesson that this man might have taught them. Always, whenever he was concerned about a patient or whenever he sensed the least anxiety on the part of this patient or of his family he would immediately call in one or more, commonly more, of the best consultants he could get. The patient was usually much pleased over these signs of his own importance, the family was reassured and given much to brag about, and if later anything went wrong, it never occurred to them to lay the blame on their beloved family doctor.

---

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Southern Minnesota Medical Association, Mankato, August 25, 1930.

Once the diagnosis was made and the treatment outlined, this wise old practitioner devoted himself to the task of making the patient comfortable. In this he spared no pains, and if the illness was severe and the family of the patient anxious he made at least three visits during the course of the day, the last one often on tip-toes at two in the morning. Good nurses were secured and no stone was left unturned to make the relatives feel that everything possible was being done.

It was remarkable, moreover, that with all his enormous practice, keeping two chauffeurs going from six o'clock in the morning to two or three o'clock the next morning, he often found time to call socially on his old patients. If for any reason there was rejoicing in a home—the promotion of a son to new honors, or the wedding of a daughter—he would drop in for a few minutes to hear about the details and to express his pleasure. He was, therefore, not only physician to hundreds of families but he was counselor and friend.

With the help of a few gossipy old ladies he kept in touch with everything that was happening among his clientele and he promptly responded to anything that might affect his interests. In his later years, when some of his younger patients began to recognize his scientific limitations and began to look elsewhere for medical advice, they had great difficulty in breaking away. When they consulted other physicians they did it furtively, not only because they hated to hurt their old friend, but because they did not dare to admit their defection to a mother or grandmother still much devoted to him. His was, I think, the most extreme example I have known, of a man who, without prestige of birth or breeding or education or physique, turned to tremendous account a knowledge of human nature and of the art of medicine.

The need for art.—Now I have not been telling you so much of this man's life and skill because I think it is so admirable or because I think a huge practice is to be desired above all things. Fortunate it is that there are many men in our profession who would refuse to give up everything worth while in life to the demands of such an inexorable treadmill. The reason why I have spent so much time talking about this man is that I could not think of a better way in which to emphasize the importance to us all of the art of medicine. Surely if a man without any scientific training could, through art alone, walk off with the best practice in a large community, what might not those of us who possess some scientific skill do if in addition to this we were to develop a finer art. This art we must try to learn, not for any selfish reasons, not with the idea only of increasing our incomes, but with the idea of giving better service to our fellow men. One of the saddest thoughts that must daily come to the sanitarian is that in this modern world there are hundreds of thousands of men and women who, when ill, refuse to accept the help which modern scientific medicine and surgery could easily give them. Often as one talks to these persons one finds that their refusal to have anything more to do with the medical profession is due to the fact that once upon a time they or their relatives were much upset by the doings of some tactless or unfriendly physician.

Furthermore, what is the use of spending ten or twelve years and thousands of dollars in giving a young man a fine training in the science of medicine if when he goes out in the world his lack of knowledge of the art is going to make it impossible for him to get a practice and to use his science. A few years ago I happened to be where I could watch the career of a young man whose knowledge in a certain field of medicine was encyclopedic. His brilliant writings soon caused many patients to seek him out but somehow or other he never seemed to learn the rudiment of tact, of savoir-faire, or of medical art; those who consulted him soon left disgruntled, and as a result he took down his shingle, and became a full-time professor in a medical school!

All of which leads me to another thought which is that today medical students, even in our best colleges, are being more and more poorly trained in this art that I am talking about. The younger generation of medical teachers today are mainly interested in the biochemistry of serious disease; more and more of them are stepping directly from the laboratory into the professorial chair, and as a result there will be fewer and fewer with any knowledge of medicine as it is practiced in a downtown office, with patients from the middle and upper classes.

Fortunately, those at the head of some of the leading schools in the country are now beginning to see the great need for correcting this defect and with good sense they are turning for help to the outstanding practitioners in their respective states, asking them either to give lectures or to act as preceptors so that the students can learn something about medical practice as it is actually being carried on out in the world. Unless this sort of thing is done, every year more and more students are going to graduate from even our best universities well equipped with information about the rarer diseases, which they will seldom encounter, and woefully unprepared to deal with the functional troubles which they will see several times a day. They will have learned much of the science of medicine but little if anything of the art.

What is this art?—But what is this art that I am now supposed to talk about? I should say that it is the knack of dealing with the patient in such a way as to gain his confidence, his respect, and his liking; it is the knack of inspiring him with the feeling that here at last is a man who understands his case and will cure him; it is the knack of keeping this trust even when things go wrong, when health and comfort do not return, and when, perhaps, as is the case with many illnesses, things continue to go from bad to worse; and it is the knack of making the patient comfortable and of adjusting the prescribed treatment to his particular idiosyncrasies of mind and body.

Can this art be learned?—Yes, most of it depends first on having a thorough knowledge of disease and this must be learned from books, or, better yet, from a careful study of patients; much of it can and must be learned by making mistakes and by profiting by them; some can be learned from teachers, but the ability to learn the art and to practice it depends largely on the student's original endowment of brain and heart, on his ability to like people, to get on with them, to understand them, to sympathize with them, and to be kindly with them. In other words, the ideal physician must be born. Probably in no other calling is there more need for good judgment, for good sense, and for the equanimity and poise and culture and charity of a philosopher.

The ideal physician can I think be fashioned most easily out of the type of man whom one commonly finds serving as the balance wheel of a large family: the relative to whom they all turn for help and advice in time of trouble. Such men often possess a certain dignity and personal prestige that make it easy for them to lead and to command their fellows. Fortunate are they who have it, because daily they must give orders, often to those who are not accustomed to receive them, and daily they must give freely of their strength and vitality and hopefulness to those who are weak and frightened and discouraged.

Some physicians fail to obtain the type of practice which their scientific skill should have brought them because they are careless about their personal appearance. Others expect well-to-do patients to come hopefully to a dingy office, which looks antiquated and down-at-the-heel. They forget or perhaps never knew that in ages past medicine was practiced successfully with the help of the prestige that came from beautiful temples and an impressive ritual. Even today the prestige that comes from a tastefully but not too elaborately decorated suite of offices filled with well dressed patients is not to be despised.

Taking the history.—There is an art in putting the patient at ease when he or she first comes in, nervous and frightened, and perhaps ready for flight. Often the physician will do well to spend the first few minutes talking about some non-medical topic: one brought to mind perhaps by noting the name of the town from which the patient comes or the name of the friend or physician who referred him. With certain patients it is helpful to establish in this way some friendly contact before starting the quiz on medical matters.

The taking of a good history, which brings into play every bit of scientific knowledge which the physician has, will at the same time call upon him for the exercise of all his skill in the art. The taking of this history and the making of a thorough physical, roentgenologic, and laboratory examination constitutes the first and most important step in the psychic treatment of a nervous and worried patient. Unless the physician takes such a history—one which brings out the details of family and business worries, of domestic infelicity, or of phobias—he cannot expect to work a cure. Unless he obtains this information the patient will go away dissatisfied because, although he does not admit it, he knows in his heart that the real cause of his trouble has not been touched.

Many patients conceal the most important facts about their troubles. They will not volunteer the information that someone has recently diagnosed cancer or syphilis, and they will even deny the fact that at home there is bickering, unhappiness, and thought of divorce. A beautiful young Italian woman who came to The Mayo Clinic recently from Chicago complaining of constant headaches maintained stoutly that her home life was happy and that she had no worries. Only from a friend was I able to learn what I suspected; namely, that her husband was in the liquor racket and that she was living in hourly dread of his assassination.

Obviously a physician who is to practice the art of medicine must learn when to suspect that these important factors are present, and he must become skillful in making the reticent patient confess. I often do it by telling a story similar to the one I expect to get. The physician must also have a sixth sense to tell him when the patient is lying and he must watch keenly for telltale signs of emotion or hesitation as answers are being made to certain questions. Time and again I have been led directly to the cause of a neurosis by noting on a woman's face signs of pain as some question was answered, or by seeing her shoot a meaning glance at her husband.

After a long history has been written down it takes perhaps as much art as science to decide what is important and what is not. This is shown so clearly in those cases in which, after having been called for twenty years a "pure neuro," a woman is found to have a gallbladder full of stones. Often then, if the physician will go back over the history, knowing at last what is relevant and what irrelevant, he can pick out here and there symptoms which, when pieced together, tell the typical story of cholecystitis.

What to say and not to say.—The greatest need for art in medicine comes when one begins to talk to the patient about diagnosis and treatment. In many cases, of course, the problem is simple; the patient is intelligent, willing to accept what he is told, and willing to coöperate. The diagnosis is clear and there is little doubt as to what should be done. But in many of the cases seen in modern consultant practice the problem is very difficult. The patient, commonly a woman, perhaps psychopathic, suspicious, overly sensitive, spoiled, and somewhat of a tartar to begin with, has traveled so much, has been told so many conflicting things, and has suffered so much at the hands of so many physicians that it is small wonder that when she goes to a new one she is on her guard, diffident, critical, and hard to influence.

In such cases the physician who is to succeed must, as he talks, watch the patient's face closely in the hope of sensing when he is saying the right thing and when the wrong. He must watch for every sign of emotion, interest, acquiescence, unbelief, antagonism, or annoyance that flits across the face of the person before him. If he sees that inadvertently he has given alarm, he must stop and reassure; if he has preached a little too pointedly and has caused resentment he must stop, to soften his words and to express sympathy; if he has failed to make things clear he must try again with simpler speech; if he is antagonizing the patient he must know it and must try another tack; or if the patient is becoming fatigued he must terminate the interview.

Although the importance of feeling one's way is perhaps greatest when one is talking to the patient in whom nothing organic has been found to explain the presence of trying symptoms, it may be great also even when the diagnosis is definite and positive. With certain patients it is no easy task to give a clear and impressive idea of the seriousness of the disorder and the need for prompt and thorough treatment without at the same time producing such alarm and resentment and unbelief that the patient will promptly leave to consult someone else. One of the worst things we physicians often do is to give from the start a hopeless prognosis. It rarely is necessary to do this; it is almost certain to destroy our further usefulness to the patient or his family; often we are wrong, and whether right or wrong, we will often lose the good will of a whole family.

We all know, also, the type of physician who when he sees what he thinks is organic abdominal disease will try immediately to rush the patient into the hospital for an emergency operation. Sometimes this maneuver works but often it does not, and then the physician is left to contemplate the fact that if he had had more art and more knowledge of human nature he would have seen in time that this particular patient could only be scared away by such tactics. I have often been told by patients that they would long before have accepted a needed operation if only the surgeon had taken the time and pains to explain in ordinary speech what he wished to do and why. Time and again I have seen Christian Scientists and other such persons who had sworn never to consent to an operation go cheerfully to the hospital after the mechanical nature of the problem involved had been explained to them, and after ample time had been given them in which to change their minds. In such cases I do not urge operation but explain the need for it and then let the idea work in gradually.

When one is talking to patients about certain serious and commonly fatal diseases there is an art also in avoiding the use of those words which are so closely bound up in their minds with the idea of hopeless suffering and death that they cannot bear to hear them used, especially when their hearts are full of anxiety and fear. I refer particularly to such words as cancer, epilepsy, Bright's disease, and consumption. If you wish to earn the undying gratitude of the harrowed and grief-stricken mother of an epileptic child, use if you will such terms as petit mal or "syndrome of meningitic irritation" or seizures, but never that dread word which will cut into her heart and brain like a knife. These may seem to be little things but many a time I have seen a patient change physicians on account of them.

One of the most devoted and grateful patients that I ever had was a man with an inoperable carcinoma of the stomach whom I tried to make fairly comfortable during the last few months of his life. I learned from his wife that they had left another physician because this man insisted on talking about cancer. The patient, like so many others with this disease, had metaphorically buried his head in the sand; like Moran of the Two Black Crows, he "didn't want to hear no more about it," and he was grateful to me because I treated him without ever a word about diagnosis or prognosis.

And this brings up the difficult problem of knowing how truthful to be with patients. Here again we often have need for all the art that we can summon to our help. If a man looks me in the eye and says, "What is the trouble?" I believe it is my moral and legal duty to tell him what it is even if it is inoperable caancer. But if, knowing in his heart what he has, or having been told by someone else, he comes at the instigation of his family and does not ask me any questions, what right have I to sear into his soul with terrible words? Often, also, when a patient is trying to find out if his albuminuria means Bright's disease the wise physician will refuse to use this dread term, because he knows that, once he has done so, no amount of explaining will ever put across the idea that the lesion is probably dormant, that it is little more than an old scar, and that there is nothing to indicate that life will be shortened.

Perhaps most important of all, if the physician does not know what is wrong it is not his duty to poison the patient's mind by telling him that his symptoms are suggestive of such diseases as brain tumor, multiple sclerosis, locomotor ataxia, or pernicious anemia. Similarly if the first Wassermann report is one plus, it is not fair to tell the patient of this and perhaps to make of him or her an incurable syphilophobe. Why not wait a day or two to see if the next two reports will not come back marked negative? In other words, the wise physician who practices the art of medicine does not tell all he knows; he carries in his heart a large share of the burden of worry, and by so doing spares the patient much anxiety and himself much unnecessary argument.

The greatest need for careful speech comes often when one has to tell a seriously incapacitated patient that the complete examination has failed to reveal signs of organic disease. Here the physician needs all the tact, sympathy, and kindness that he can summon to his help. After reviewing the record and explaining that nothing has been found that would justify surgical intervention, I think it well to admit that, although this should occasion considerable rejoicing, it also has its disappointing side. I try to assure the patient of my confidence in the existence of his symptoms, and I remind him that many bodily functions can be upset in sensitive persons by strong emotion, worry, and fatigue.

If the patient has been overworking and losing a great deal of sleep, I picture to him thousands of delicate brain cells crying out for rest; I suggest that he give heed to their complaint, that he cut down on work, try a simpler diet and better methods of regulating the bowels, and see what happens. If everything clears up, we shall be happy; if some of the symptoms disappear and others remain or if new ones appear and others get worse, the correct diagnosis may either become obvious or another careful examination may show what is wrong. One great advantage of this method is that I have not burned my bridges behind me. If things go wrong, if new symptoms develop and the diagnosis becomes obvious even to a tyro in medicine, I shall not be humiliated by having my mistake corrected, perhaps by some unfriendly critic, and I shall not have earned the contempt and enmity of the patient and his family.

I could go on perhaps for hours telling you about the art of adjusting a diet to the needs of a fussy patient, the art of making certain persons eat more, the art of carrying out a successful rest cure, or the art of conducting a satisfactory consultation, but I think I have already made my point, which is that a knowledge of the art of medicine can greatly extend the usefulness of every skilful and scientific physician in the community; it will enable him to render better service to a greater number, and it will bring greater peace of mind and hope and comfort to his patients.

MISLEADING METHYL CHLORIDE PUBLICITY

The Committee on Poisonous Gases of the American Medical Association issued a report emphasizing the hazard arising from the use of methyl chloride in refrigerators. In the view of the committee it is more commendable to work toward the attainment of a nonhazardous refrigerant than toward the attainment of a usable warning agent. Nevertheless, chemical manufacturers have apparently been able to induce the Bureau of Mines to make studies of the properties of methyl chloride and methyl chloride to which has been added acrolein, an irritating warning agent. One of these concerns, the Roessler & Hasslacher Co., markets methyl chloride under the trade name of "Arctic" and Methyl Chloride A, which is pure "Arctic" plus 1 per cent of acrolein. A report of the Bureau of Mines appeared which was written in such a way as to lend itself to use as advertising copy by writers seeking to create favorable propaganda for commercial exploitation of methyl chloride. The report emphasized that methyl chloride exerts no deleterious effects on the contents of the refrigerator and implied that it is therefore of no importance whether or not methyl chloride escapes into the refrigerator. The major point—the hazard of escaping methyl chloride to occupants near the source of the leak—is not stressed. The Roessler & Hasslacher Chemical Company has used the report to create the impression that "Arctic" is a relatively harmless substance and the last word in efficient and safe refrigerants. It is unfortunate that a branch of the government, the Bureau of Mines, has been swayed to serve more the interests of chemical manufacturers than to serve the interests of the public. (Jour. A. M. A., January 24, 1931, p. 272.)

TREATMENT OF COUGH AFTER BRONCHITIS

Children who cough should not be permitted to attend school. If the child has fever, it should be kept in bed. Warmth, as uniform as possible, is the prime requisite in the treatment of colds and acute coughs. The chief of all expectorants is water: without it most medicinal expectorants fail and, with an abundance of it, they may not be required. Nevertheless, they probably contribute, when wisely used, to a speedier evolution of the various stages of bronchitis and to a more rapid recovery. The salines, chief among them ammonium chloride and sodium citrate, head the list of agents that may reasonably be expected to be of use in "loosening up" a cough, provided they are given freely, frequently and with plenty of fluid. Iodid, the most powerful of the saline expectorants, should not be employed until the acute stage is well over. When the cough is "loose," aromatics may be of value such as terpin hydrate and creosote. A cough that hangs on is not so much an indication for medicine as a challenge to determine why it does. (Jour. A. M. A., January 3, 1931, p. 61.)

ANTITOXINS AGAINST SCARLET FEVER

No "one-shot" method of active immunization against scarlet fever has proved effective. The present status of the "ricinoleated antigens" is that they are of unestablished value. Their therapeutic action has not been proved. Scarlet fever ricinoleated antigen has been distributed by only one concern and that concern has recently discontinued the manufacture and distribution of ricinoleated antigen and is recalling it from the market. (Jour. A. M. A., January 24, 1931, p. 292.)

FIBROSARCOMA OF A MECKEL'S DIVERTICULUM PRODUCING INTESTINAL HEMORRHAGE*

Louis S. Faust, M.D., and Waltman Walters, M.D.
Rochester, Minnesota

MECKEL'S diverticulum is found in from 2 to 3 per cent of the population, according to necropsy records, and, as is commonly known, is due to failure of the vitelline or omphalomesenteric duct with its accompanying vessels to become completely obliterated. It usually arises from the ileum about 90 cm. from the illeocecal valve, although rarely it may be found anywhere in the gastro-intestinal tract from the cardia to the rectum. It varies in size, from 2.5 to 10 cm. in length. Ordinarily the diverticulum is found on the antimesenteric border of the ileum but it may exist at any point on the circumference of the ileum and rarely between the leaves of the mesentery. Under the latter conditions, when it is of sufficient length, it may resemble an intestinal duplication. The vessels accompanying the vitelline duct may fail to become completely obliterated; they may persist as fibrous cords, and are found either hanging free from the tip of the diverticulum or attached to the abdominal wall at or near the navel or to the mesentery. The point of attachment of these congenital bands in the abdominal cavity is variable. These bands are important sources of intestinal obstruction and strangulation, as has been so clearly shown by Fitz. At times a separate mesentery is found connected with the diverticulum. Schaetz demonstrated gastric epithelium in Meckel's diverticula and has shown that this aberrant gastric mucosa may be the seat of ulceration similar to peptic ulcer.

That ulceration in a Meckel's diverticulum may result in massive intestinal hemorrhages with severe secondary anemia has been noted by a number of observers.[1, 10, 12, 13, 15, 18] From a survey of the literature, it would seem that most cases occur in infants or children. As in the duodenum or stomach, these ulcers may give rise to hemorrhage or perforation. Inflammatory changes not infrequently occur in the diverticulum.

Coley and others reported tuberculous ulceration of a Meckel's diverticulum and mentioned that typhoid perforation has occurred.

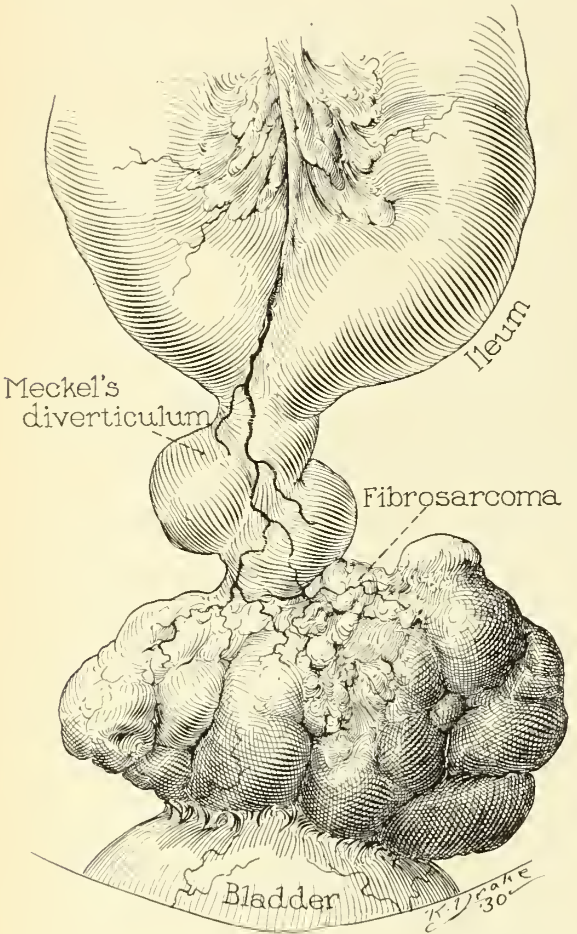
Invagination of Meckel's diverticulum with formation of intussusception may occur. Hertzler and Gibson, Shannon, and others reported such cases. Deformities about the umbilicus should suggest the presence of a persistent vitelline duct. Usually the distal end of the diverticulum closes but it occasionally remains open, forming an umbilical fecal fistula. A prominent reddened tumor called an omphalo-adenoma occasionally may be seen when only the umbilical portion of the vitelline duct remains.[3, 7] The diverticulum may be the sole occupant of a hernial sac.[3]

There is nothing distinctive or pathognomonic in the clinical features of the various pathologic changes which occur in Meckel's diverticulum. The fact that this product of faulty development is present in from 2 to 3 per cent of persons and may produce clinical signs of intestinal obstruction, perforation or hemorrhage, alone or in combination, should be emphasized. The symptoms may simulate those of appendicitis or intestinal obstruction. Since the lesion is small, roentgenologic examination of the gastro-intestinal tract may be indeterminate, although it is of great aid in ruling out lesions of the esophagus, stomach, duodenum and colon as a source of trouble. Repeated attacks of cramping abdominal pain starting in childhood or even infancy, especially if associated with hemorrhage from the bowel, should put the examiner on his guard. Pain and tenderness in the region of the navel also is evidence. The surgeon who finds a comparatively normal-appearing appendix in cases in which the symptoms have pointed to appendicitis should explore the small intestine for a diseased Meckel's diverticulum. As with appendicitis, the troubles to which Meckel's diverticulum are heir are likely to be surgical emergencies.

We have been able to find records of only seven cases of malignant tumor in Meckel's diverticulum. The case presented here is the only one of fibrosarcoma that has been encoun-

---

*From the Divisions of Medicine and Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Southern Minnesota Medical Association, Mankato, August 25, 1930.



MAYO CLINIC

Fig. 1. The tumor in situ. Origin from the tip of the Meckel's diverticulum and attachment to the fatty tissue over the dome of the urinary bladder are shown.

tered in the records of The Mayo Clinic. Hicks and Kadinsky operated on a boy aged twelve years for suspected appendicitis and found a perforated, infected carcinoid tumor of a Meckel's diverticulum, such as Lubarsch has described in the appendix, ileum and jejunum. Hässner operated on a man aged fifty years, and found a necrotic tumor which was thought to have originated from a Meckel's diverticulum; a diagnosis of acute appendicitis had been made. Crile and Portmann reported the case of a woman aged forty-one years on whom they operated for incomplete intestinal obstruction and encountered a fibrosarcoma of a Meckel's diverticulum. Tschiknawerow reported discovering at necropsy on a woman aged sixty-two years a spindle-cell sarcoma of a Meckel's diverticulum which had become necrotic and had perforated, causing generalized peritonitis. Kaufmann mentioned a spindle-cell sarcoma of a Meckel's diverticulum in the Basler Collection of Pathologic Specimens. Symmers described a malignant myoma springing from the base of a Meckel's diverticulum removed from a man aged twenty-two years; it was discovered by accident during the course of an operation for hernia. Symptoms traceable to its presence could not be elicited. Black's patient was a woman aged fifty-nine years, with a large myxomatous abdominal tumor. Its exact origin was doubtful, although it was believed that it arose from a diverticulum of the sigmoid which may or may not have been the remains of a vitelline duct.

REPORT OF A CASE

A man, aged sixty-two years, came to the clinic February 24, 1930, complaining of recurring hemorrhages from the rectum and a dull sensation of pressure in the left lower part of the abdomen. He had been in perfect health until fourteen months prior to admission, when he noticed tarry stools for two days. Weakness and pallor were noticeable at this time and he was anemic. Three months later he passed several ounces of bright red blood by rectum. Approximately every month since then he had had considerable bleeding from the rectum, at times bright red, at other times black and tarry. Appetite and digestion had been excellent. Aside from the indefinite sensation of pressure in the lower part of the abdomen, noticed only in the sitting posture, there had been no abdominal pain. A history of peptic ulcer could not be elicited. The patient had been moderately constipated for years. Slight edema of the lower extremities had been present following a febrile illness twenty years previously, probably phlebitis.

The patient appeared somewhat pale and the hemoglobin was somewhat below normal, 11.5 gm. for each 100 c.c. by the photo-electric method and approximately 65 per cent by the Dare method. The erythrocytes numbered 4,070,000 and the leukocytes 5,500 in each cubic millimeter. The systolic blood pressure was 155 and the diastolic 90. The pulse was 64 and temperature 98°F. Urinalysis, analysis of the gastric contents and roentgenograms of the thorax yielded negative results. Aside from diverticula of the descending colon, the roentgenograms with the barium enema failed to reveal evidences of a lesion. Abdominal mass was not palpable. Proctoscopic examination revealed hemorrhoids of moderate degree. The patient was told that the passage of the fresh blood could easily be accounted for by the hemorrhoids but that the old blood suggested a higher lesion. However, we felt that there was not enough evidence to warrant more than hemorrhoidectomy at this time, especially since stasis of blood in the rectum from bleeding internal hemorrhoids may occur, resulting in the passage of old blood.

Hemorrhoidectomy was performed March 3, 1930, and seven days later a severe rectal hemorrhage of old tarry blood occurred which the proctologists believed came from a point higher in the gastro-intestinal tract. The hemoglobin dropped from the previous level of 11.5 to 6.8 gm. for each 100 c.c. of blood. Pallor and weakness were marked. Several days after cessation of the hemorrhage the patient was reëxamined. Roentgenograms were again made of the esophagus, stomach, duodenum and small intestine, following the ingested barium meal, but a lesion was not demonstrable. Blood smears revealed a normal differential count and secondary anemia with moderately active regeneration. Special study of the blood did not reveal evidence of a hemorrhagic blood dyscrasia. Bleeding peptic ulcer, duodenitis, tumor of the small intestine, and ulceration of Meckel's diverticulum were considered.

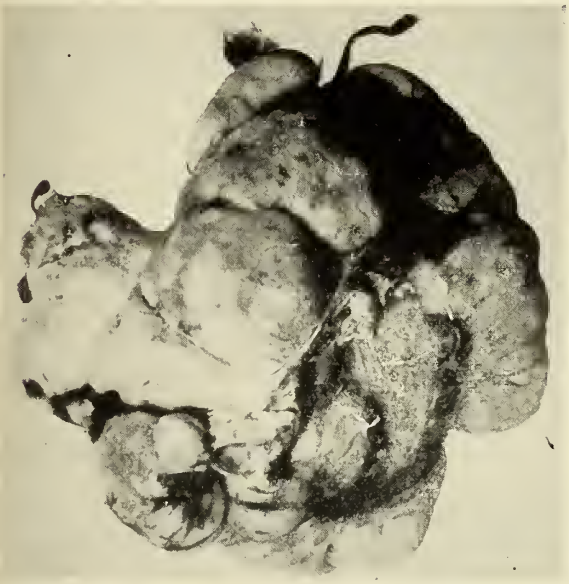


Fig. 2. The tumor and the Meckel's diverticulum after their removal. Gross ulceration was not demonstrated.

Exploration was advised. A transfusion of blood was given March 22, and March 25 exploratory laparotomy was performed (Fig. 1). A tumor approximately 7 cm. in diameter was found extending from the tip of a Meckel's diverticulum. It was superficially attached to the fatty tissue over the dome of the urinary bladder. The mass was dissected away from the bladder. The attachment was cauterized with the actual cautery and inverted with a double stitch of chromic catgut (Fig. 2). The diverticulum, together with the tumor, was dissected out with the cautery, without the application of clamps in order to keep well away from the growth. Neither gross nor lymphatic involvement was discovered. The opening in the ileum was closed transversely with three rows of chromic catgut and a single row of interrupted sutures of silk. There were no other abnormalities, aside from slight enlargement of the spleen. The Meckel's diverticulum was about 60 cm. from the ileocecal valve. Microscopic examination of the tumor disclosed fibrosarcoma 9 by 7 by 5 cm. (graded 2) in a Meckel's diverticulum (Fig. 3).

Convalescence was satisfactory. A communication from the patient, July 8, stated that he was in good health.

The clinical features of this case are entirely different from the malignant tumors of Meckel's diverticulum reported in the literature. Intestinal hemorrhage with secondary anemia was the only significant feature. Loss of weight, abdominal mass, and evidences of perforation, obstruction or inflammation were not present. Laboratory examinations failed to disclose the condition. This case illustrates the value of abdominal exploration in cases of indeterminate intestinal hemorrhage. Although the lesion is rare, it adds another to the list of causes of intestinal bleeding.

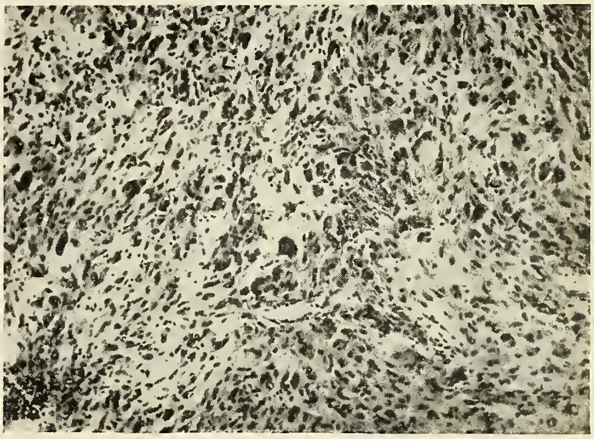


Fig. 3. Fibrosarcoma graded 2, with numerous thin walled blood vessels which undoubtedly were the sources of the repeated intestinal hemorrhages. Foci of lymphocytic cells are seen throughout the section.

BIBLIOGRAPHY

1. Abt, I. A., and Strauss, A. A.: Meckel's diverticulum as cause of intestinal hemorrhage. Jour. Am. Med. Assn. 87:991-996 (Sept. 25), 1926.
2. Black, W. T.: Congenital diverticula of the intestines. Surg., Gynec. and Obst. 28:473-477 (May), 1919.
3. Coley, B. L.: Tuberculosis of Meckel's diverticulum associated with tuberculous appendix. Arch. Surg., 11:519-528 (Oct.) 1925.
4. Crile, G. W., and Portmann, U. V.: Primary spindle cell sarcoma of Meckel's diverticulum. Surg., Gynec. and Obst. 41:615-617 (Nov.), 1925.
5. Fitz, Reginald: Persistent omphalo-mesenteric remains; their importance in the causation of intestinal duplication, cyst-formation and obstruction. Am. Jour. Med. Sc., n.s., 88:30-57, 1884.
6. Hässner, Hugo: Zur Pathologie des Meckelschen Divertikels. Frankfurter Ztschr. f. Path., 14:501-516, 1913.
7. Hektoen, Ludvig: Vitelline-duct remains at the navel. Am. Jour. Obst., 28:340-352 (Sept.), 1893.
8. Hertzler, A. E., and Gibson, E. T.: Invagination of

Meckel's diverticulum associated with intussusception: report of a case, with a study of recorded cases. Am. Jour. Med. Sc., 146:364-386 (Sept.), 1913.

9. Hicks, J. A. B., and Kadinsky, S.: A case of "carcinoid tumour" of a Meckel's diverticulum. Lancet, 2:70 (July 8), 1922.
10. Jackson, R. H.: Hemorrhagic ulcer of Meckel's diverticulum. Ann. Surg., 80:222-224 (Aug.), 1924.
11. Kaufmann, Eduard: Lehrbuch der speziellen pathologischen Anatomie für Studierende und Arzte. Ed. 6, Berlin, G. Reiner, vol. 1, pp. 464-465, 1911.
12. Mayo, W. J., and Johnson, A. C.: Meckel's diverticulum. Surg. Clin. N. Amer., 6:1127-1130 (Oct.), 1926.
13. Peterman, M. G., and Seeger, S. J.: Meckel's diverticulum with hemorrhage. Am. Jour. Dis. Child., 36:515-522 (Sept.), 1928.
14. Schaetz, Georg: Beitrage zur Morphologie des Meckel'schen Divertikels. Beitr. z. path. Anat, u. z. allg. Path., 74:115-293, 1925.
15. Schwarz, E. G., and Daly, Jack: Meckel's diverticulum associated with severe hemorrhage. Jour. Am. Med. Assn., 93:1468 (Nov. 9), 1929.
16. Shannon, W. R.: Meckel's diverticulum in infancy and childhood. Arch. Pediat., 45:693-700 (Dec.), 1928.
17. Symmers, D.: The association of malignant myomata with Meckel's diverticulum. Ann. Surg., 70:183-187 (Aug.), 1919.
18. Tisdall, F. F.: An unusual Meckel's diverticulum as a cause of intestinal hemorrhage. Am. Jour. Dis. Child., 36:1218-1223 (Dec.), 1928.
19. Tschiknawerow, Leon: Zur Kenntnis der pathologischen Gewebsbildungen im Meckel'schen Divertikel. Berl. klin. Wchnschr., 2:1676-1679, 1911.

FIRST AID BY THE MANUFACTURER.

Doctors received during the Christmas season a copy of the pamphlet entitled "First Aid and Emergencies," prepared by McKesson and Robbins for circulation to the public. It is not surprising to find from consultation of this pamphlet that first aid covers a wide variety of conditions and that apparently McKesson and Robbins have developed something for each of these conditions. Thus, anemia is listed among the conditions demanding first aid and the patient is given full instructions for its control. In addition, biliousness and liver trouble, Bright's disease, diabetes, eczema, gout, rheumatism and tuberculosis are among the conditions demanding first aid. True, the book mentions in various places the desirability of calling a physician, but the patient is encouraged to take a chance. This pamphlet represents one of the worst phases of proprietary medicine business. (Jour. A. M. A., January 3, 1931, p. 44.)

INSUROL IN DIABETES

"Insurol" is a nostrum sold on the mail-order plan by a concern or concerns known, variously, as the Official Products, Inc., and New Life Products Co. Insurol has been described as a "triumph of Germany's biochemical laboratories," and, it is said, "combines insulin with the actual substance of the pancreas gland." In diabetes quackery, two elements are nearly always found: The first is that of requiring the person who uses the nostrum to adopt a diet that is low in carbohydrates. The second, and more common, is that of incorporating in the nostrum a diuretic. The average diabetic patient has some rough-and-ready method of estimating the amount of sugar that is excreted. In a report regarding the assumed effects from Insurol, there are many factors that may explain the alleged reduction of sugar. (Jour. A. M. A., January 31, 1931, p. 378.)

IRRADIATION OF CARCINOMA OF THE CERVIX UTERI*

Harry H. Bowing, M.D., and Robert E. Fricke, M.D.
Rochester, Minnesota

THERAPEUTIC radiology has made substantial advances during its brief existence. The discovery of the roentgen ray dates back only thirty-five years and of radium only thirty-two years; their therapeutic application covers three decades. The discoveries were made abroad and hence the initial therapeutic applications were made there. Radium was first used in the treatment of uterine hemorrhage by Oudin and Verchère. Chéron was the first effectively to treat this same disease.

Among the earliest forms of carcinoma to be treated with radium was carcinoma of the cervix of the uterus. Carcinoma in this situation presented an urgent problem because of its prevalence and because surgical results had been far from satisfactory. It was well adapted to the new form of treatment because of the accessibility of the part to inspection and palpation, and because it afforded opportunity for microscopic examination of tissue. Radium was first used in carcinoma of the cervix in 1905, but not effectively used until Dominici, in 1907, introduced the principle of proper screening of applicators. Wickham, in Paris, working since 1906, published in 1913 the results of 1,000 cases in which radium was used. In early work, with small amounts of radium, not well filtered, the caustic effects predominated. After this pioneer work abroad, work was started in this country, and in 1915 Kelly and Burnam reported on their work with radium to the American Medical Association and the American Gynecological Society; this work dated from January, 1909. Irradiation for carcinoma of the cervix was commenced at The Mayo Clinic and at the Memorial Hospital in New York[13] in 1915.

Radium and roentgen treatment offer the only hope to sufferers from carcinoma of the cervix except for the achievements of surgery in early cases. In the few early cases diagnosed, both surgery and radium result as a rule in cure for at least five years. In most cases lesions are advanced and inoperable but radium and roentgen rays can salvage from 20 to 25 per cent for a period of five years, with a primary mortality of approximately 1 per cent. This result so far excels that achieved by surgery that less and less operating is done for this condition.

The results of irradiation are fairly constant throughout the world, although the diversity of methods of treatment is surprising. The main radiologic clinics of the world differ substantially in their methods of application, although the basic principles are fairly uniform. To illustrate this we will summarize the methods and results of a few of the radiologic clinics abroad and in this country.

In France, the pioneer, Regaud,[4, 22, 23] was the originator and is the chief proponent of the long-continued small dose. His technic is reproduced extensively abroad and in many places in this country.[19] Continuous irradiation is applied within the cavity of the uterus and against the cervix for a period of five to ten days. Forty to sixty milligrams are used, half intracervically and the remainder contracervically, three tubes in each position. Platinum screening of 1.0 mm. thickness is used with 2.0 mm. platinum screening on the vaginal tubes. The uterine applicator is a Para rubber catheter 6 cm. long, holding, usually, three capsules of radium. The intra-uterine capsules are filtered with 1 mm. platinum and 0.2 mm. aluminum foil. The capsule nearest the fundus contains 6.66 mg. radium element; each of the lower tubes contains 13.33 mg. radium element. The intra-uterine applicator hence usually contains 33.32 mg. of radium element, which in five days delivers 4,000 milligram-hours. The vaginal applicators consist of three or four capsules each containing 13.33 or 6.66 mg. of radium element; the strength of the wall is 1.5 mm. platinum and each is inserted in an ordinary cork, the walls of which are 0.5 cm. thick. The radium capsule is wrapped in aluminum foil and inserted in the center of the cork; the open ends are closed by plugs of cork and the applicator is immersed in boiling paraffin to sterilize it and to furnish an impervious coat. The corks to fit in the fornices are usually connected by a rubber-covered strip of steel, which also maintains the third cork against the face of the cervix. Usually 26.66 mg. is the total amount of radium placed in the vagina; five days of treatment will yield about 3,168 milligram-hours. Thus, using only about 60 mg. of radium, 7,200 milligram-hours is given in a treatment of five days.

---

*From the Section on Therapeutic Radiology, The Mayo Clinic, Rochester, Minnesota. Submitted for publication August 11, 1930.

The radium is removed daily, is cleansed, and is replaced after a vaginal douche has been given; treatment is stopped if the temperature rises above 101.5°F. or if the number of leukocytes in each cubic millimeter of blood falls below 3,500. Total dosage varies between 5,000 and 10,000 milligram-hours. External irradiation is used if the parametria are involved, and consists of highly filtered roentgen rays, as follows: 200 kilovolts, 4 to 5 milliamperes, 2 mm. zinc, 3 mm. aluminum, and 3 cm. wood filters, 60 to 80 cm. distance, six or more overlapping 15 by 15 cm. fields, one hour twice daily for a period of ten to twenty-five days; twenty-five to fifty-five hours of actual irradiation. This precedes the application of radium. Or, preferably, radium is also used for the external treatment: a lead cylinder containing 4 gm. of radium is placed over the eight pelvic portals at 10 cm. distance, for three hours daily. The total dosage amounts to 320 gram-hours (40 gram-hours for each portal). Locally there is considerable slough, which reaches its height the third week, when the toxic absorption is most marked. The rationale of the continuous small dose is to catch all carcinoma cells at the period of mitosis, ostensibly their most vulnerable phase. Following are the results at the Radium Institute of Paris:[4] thirty-eight early lesions, with 42 per cent of five-year cures; 132 borderline lesions with 28 per cent five-year cures; 149 inoperable lesions, with 10 per cent five-year cures, and thirty-one massive lesions with no five-year cures. Of the total 350 patients treated by radium and roentgen ray, seventy (20 per cent) obtained five-year cures.

In Stockholm,[4] the technic evolved by Forssell and Heyman,[14] and used since 1913, is founded on the following principles: (1) a small number of applications (three at most); (2) relatively large quantities of radium at each application, 100 to 120 mg. of radium element; (3) heavy filtration (filter equivalent to 3 mm. lead); (4) concentration of the whole treatment into a shorter period of time (three to four weeks), and (5) an interval of one week between the first two applications and of three weeks between the two last, with a total irradiation of about sixty hours.

The wall of the tube represents 1 mm. of lead and the wall of the applicator about 2 mm. For the secondary filtration, thin rubber is employed in the uterine cavity, and in the vagina two layers of thin paper and a thin layer of cotton-wool covered with thin rubber or oiled silk.

If the cervical canal can be dilated, radium is inserted into the uterine cavity at all three treatments, as well as against the vaginal surface of the tumor. The total dose in all three applications is 2,200 to 2,600 milligram-hours in the uterus and 4,500 milligram-hours in the vagina. In each of the three applications the uterus receives about 730 to 865 milligram-hours and the vagina, 1,500 milligram-hours. Each single dose entails about twenty hours of treatment. A typical series of treatments follows:

First treatment: In the uterus (4 tubes) 40 mg. × 19 hours = 760 milligram-hours. In the vagina (12 tubes) 78 mg. × 19 hours = 1,480 milligram-hours.

Second treatment: In the uterus (1 tube) 43 mg. × 21 hours = 900 milligram-hours. In the vagina (10 tubes) 71 mg. × 21 hours = 1,490 milligram-hours.

Third treatment: In the uterus (1 tube) 39 mg. × 19 hours = 720 milligram-hours. In the vagina (10 tubes) 80 mg. × 19 hours = 1,520 milligram-hours.

Aggregate dose: In the uterus 2,380 milligram-hours. In the vagina, 4,500 milligram-hours.

A specimen for microscopic examination is taken after insertion of the intra-uterine capsule.

Roentgen treatment in addition has been added since 1922 only for those cases in which isolated nodal metastasis or large parametric infiltration has been present at the commencement of treatment. Radium packs have also been used externally with encouraging results, but too recently to permit judgment of them.

The results have been as follows: 737 patients were treated from 1914 to 1923 inclusive; the condition of 25.5 per cent of these was operable. The primary mortality was 2.1 per cent. Among the 188 operable cases, 43.6 per cent of patients obtained five-year cures. Inoperable and borderline cases together, 549 in all, gave 16 per cent five-year cures, and 492 inoperable cases alone yielded 13 per cent five-year cures.

In Erlangen, Wintz is using roentgen treatment exclusively for carcinoma of the cervix. He uses two series of treatments, employing small fields, 6 by 8 cm. and 8 by 8 cm. In the first series, a full dose for carcinoma is given to the uterus alone. Eight weeks later treatment is directed to the parametria, and at the same time 80 per cent skin erythema dose is administered to the primary lesion. He reported 108 inoperable cases with 57.4 per cent five-year cures, and 632 inoperable cases with 12.3 per cent five-year cures. This method is a very severe one for the patient. Huge quantities of roentgen rays must be absorbed by overlying tissues from the rays directed to the lesion in the depths. It has not been possible to duplicate this work in this country, and cures have not been reported here to our knowledge from roentgen rays alone.

In Munich, the physicians of the Döderlein Clinic[7] are enthusiastic about the results of radium and roentgen treatment. Hysterectomy has been abandoned there since 1913. Von Seuffert reported 80 per cent of five-year cures in early cases in which the entire course of treatments was given. This record equals the report of 80 per cent of five-year cures by surgery alone given by Von Franqué.

Since 1918 roentgen treatment has been added to radium treatment. The method consists of two or more treatments at intervals of eight weeks.[4] In the first treatment sensitization of the tumor is attempted by application of roentgen rays to the pituitary body. Each temple is irradiated over an area 6 by 8 cm. as follows: at 200 kilovolts, 2.5 milliamperes, 30 cm. distance, and filtration is 1 mm. copper. Each field receives 30 per cent of the erythema dose. The following day roentgen rays are applied to the pelvis: 10 by 15 cm. fields are used, one abdominal and one dorsal exposure; 200 kilovolts, 2.5 milliamperes, 50 to 60 cm. distance and 1 mm. copper filtration; each field receives 90 per cent of the erythema dose. The pelvic irradiation is performed in one day if possible.

Biopsy is performed the following day, and the day after that radium is applied. Several tubes are placed within the uterus and cervix, aggregating 55 mg. radium element, filtered with 0.2 mm. silver, 1 mm. brass, and a layer of thin rubber. The radium is left in place for twenty-four hours. The vaginal applicators consist of several tubes with filtration of 1 mm. brass imbedded in corks; the total amount used is 55 mg. radium element and this is left in place twenty-four hours.

The second treatment, eight weeks later, is a repetition of that just recorded except that further irradiation of the pituitary body is omitted.

Results were gathered from 1,319 patients treated between 1913 and 1923 inclusive. The rate of operability in this group was 17.2 per cent. Considering the operable group, 163 patients received full treatment and 50.2 per cent obtained five-year cures. In twenty-five borderline cases in which complete treatment was given, 28.3 per cent of the patients obtained five-year cures; also 13.1 per cent of 543 patients with inoperable lesions and 1.2 per cent of 239 patients with massive lesions obtained five-year cures. The total rate of survival for five years among 1,216 patients who received the full treatment (103 stopped after one treatment) was 18.2 per cent.

In Switzerland, Fürst, at Zürich University, advocates roentgen treatment followed by radical hysterectomy (Wertheim's operation) six weeks later, and following this roentgen or radium treatment if malignant tissue cannot be entirely removed. If the growth has been cleanly extirpated, further irradiation is not employed unless recurrence occurs. The method is too recent to judge of its merit; results have not yet been published.

At the Radium Institute of Brussels, a utero-vaginal application is made first, involving dilatation for insertion of intra-uterine tubes and insertion of tubes in the fornices. Filtration consists of 2 mm. platinum and special rubber. One or two tubes are placed in the uterus and one in each lateral fornix; each tube contains 10 mg. radium element. The length of application is twelve to fifteen days, with removal and cleansing of the tubes every two days. The total dosage is 7,920 to 9,240 milligram-hours. In some cases, intra-abdominal treatment is added by performing laparotomy and placing needles and tubes containing 10 mg. at the base of each broad ligament. The radium is withdrawn after six days. Results are meager, as the Brussels Radium Institute is of recent development. In eleven operable cases, 54.5 per cent of patients obtained five-year cures; of fourteen inoperable cases, 35.7 per cent of patients lived five years.

In England, Cade is enthusiastic concerning his treatments with radium; the methods follow those of the Regaud and Belgian schools. Results are not yet published.

In this country, Kelly and Burnam were pioneers in this treatment.[17] They use the massive dose, given in one application, and see no advantage in small doses given for a longer time. Radon, in brass tubes with walls 2 mm. thick, is used. With the patient in the knee-chest position, two tubes are placed intracervically, and five to eight tubes (equalling in amount the intracervical radium) are placed in a gauze package against the face of the cervix. They consider this method to yield sufficient cross-firing without placing radium in the uterine canal. One thousand to 1,500 millicuries are used altogether. Two or more pieces of ¼-inch lead wrapped in gauze are placed above the cervix to protect the rectum, and the vagina is filled with gauze. Lead is not placed on the side of the bladder. The total treatment consists of 3,000 millicurie-hours, given usually in two hours' time. Extension in the parametria is taken care of by implantation of radon seeds through the vagina. Since 1924 high-voltage roentgen rays have been added to take care of parametrial extension, in cases which do not clear up in two months. In all cases, a piece of tissue about 2 by 3 mm. is taken for microscopic study. Patients are dismissed for three months following treatment. An extensive slough, with formation of a grayish-green membrane and foul discharge, occurs about a month after treatment. Two hundred thirteen patients treated prior to 1915 were traced. All patients, even if the condition was hopeless, were treated. Fifty per cent of the patients in the operable group were well after seven years, and of the inoperable group 7.8 per cent had survived for seven years.

In Philadelphia, at the University Hospital and the Philadelphia General Hospital, radium and surgery are used. Under general anesthesia trachelectomy is performed with the cautery whenever feasible, and the bladder is separated surgically nearly to the peritoneal attachment. Following excision of the cervix, 50 mg. of radium is applied to the canal and a like amount to the cervical stump, in a metal, T-shaped instrument devised by Clark; filtration consists of 1 mm. brass and 0.5 mm. aluminum. The duration of the treatment is twenty-four hours; the dosage totals 2,400 milligram-hours. Treatment is given in the dorsal position under anesthesia, with two retractors to expose the field. Biopsy is obtained at operation. A piece is removed from the edge of the cervix, not less than 2 cm. in diameter, and should include normal cervical tissue. There is diversity of opinion as to the advantage of roentgen treatment; it is given as a routine at the Philadelphia General Hospital and not at the University Hospital. Clark and Norris reported 28.5 per cent of five-year cures in early cases with radium alone, and 83 per cent of five-year cures in early cases with trachelectomy and radium, considering a total series of 214 cases. In the advanced cases, irradiation alone cured in 5.1 per cent for a period of five years, and irradiation and amputation by cautery gave a five-year cure in 20 per cent. All cases combined, irradiation alone cured in 5.9 per cent for five years, with a mortality of 1.4 per cent, and irradiation with amputation by cautery in 42.9 per cent with an operative mortality of 10.6 per cent.

In New York carcinoma of the cervix has been treated with radium at the Memorial Hospital[13] since 1915; treatment has been given in about 2,000 cases to date. Up to 1921, radium only was used, topically and also for external cross-firing. Since January, 1922, roentgen rays have been used for the external treatment, following the course of radium or in foul necrotic lesions preceding it. Healy stated that at least two-thirds of all his patients have parametrial involvement when first seen. Local recurrences are rare after five years, but recurrences in the parametrial lymph nodes may take place after six, seven, or eight years. Hence, particular attention is paid to cross-firing the parametria with external irradiation. High-voltage roentgen rays replaced moderate voltage in the last three or four years. The exposures are made at five portals encircling the pelvic girdle, the fifth one centered on the third lumbar vertebra to affect the prevertebral lymph nodes in this region. The factors given are as follows: 200 kilovolts, 0.50 mm. copper, 1 mm. aluminum, 50 cm. distance, 4 milliamperes, 60 to 80 minutes and 15 by 15 cm. Radium is applied intracervically in a two-tube tandem arrangement and in a vaginal bomb containing a large amount of the element. Six thousand millicurie-hours are given, half intracervically and half vaginally, within forty-eight hours. The combination of radium and intensive roentgen treatment produces from 400 to 6,000 per cent skin erythema dose throughout all parts of the pelvis. Interstitial application or needles are used only after several weeks if the lesion does not regress satisfactorily. This can be defined as the true massive dose. For the years 1922, 1923 and 1924 the following results are quoted: 44.5 per cent of five-year cures in the early and borderline cases. Recent results in inoperable cases are not given.

In New York at the Woman's Hospital Clinic, Ward employs radium by the method of inserting small amounts in the cervical canal, screened with brass and rubber, and placing needles 2 cm. apart throughout the cervix. The initial treatment is 2,400 to 4,200 milligram-hours. External irradiation is not used. Results in 134 cases were 53.1 per cent five-year cures in thirty-two favorable cases (operable and borderline lesions) and 23.1 per cent in all cases.

In Chicago, Schmitz[25] has been using radium and roentgen rays in this disease since the beginning of 1914. He uses radium in an intracervical applicator (two 25 mg. tubes in 1.5 mm. brass) for a period of twenty-four hours. High-voltage roentgen treatment is added, so that the irradiated region attains 110 to 130 per cent skin erythema dose. Schmitz[24] stated: "If we use radium without roentgen ray in cervical carcinoma we are at a disadvantage due to the rapid decrease of the intensity and therefore inhomogeneous distribution of the rays. The regional lymphatics cannot be effectively destroyed. If we employ roentgen ray without radium then we are limited by the tolerance of the skin to a low dose though a homogeneous distribution of the rays throughout the pelvis is attained. However, if we use a combination of radium and roentgen ray we can obtain a homogeneous distribution of a radiation intensity throughout the pelvis." Schmitz[26] reported his latest five-year results as follows: 78.27 per cent of five-year cures in early cases, 41.68 per cent in borderline cases, 12.42 per cent in inoperable cases, or a five-year salvage of 17.5 per cent in a total of 332 cases.

At Montclair, New Jersey, Stevens follows the Regaud technic, keeping his patients under influence of roentgen ray and radium for twelve weeks. The number of patients treated averages fifty a year, and 84 per cent of five-year cures are obtained in early cases, 42 per cent in borderline cases, 19 per cent in advanced cases, and no cures in cases of massive growths.

In Boston, Simmons and Leland employ radium at the Huntington Memorial Hospital. Formerly the treatment consisted of applications of screened radium, repeated every two or three months. At present, one heavy treatment only is given and that under general anesthesia. A patient receives about 5,000 millicurie-hours divided between silver-screened irradiation and gold seeds; the idea of using seeds is to prolong the exposure. The results, they state, have been very satisfactory but they are not yet published. Simmons and Leland are studying the results in 803 cases. In 1924 Leland reported three-year results with similar massive doses of so-called "unscreened" radium; the tubes of emanation were enclosed in steel jackets, and the glass seeds were left permanently. The radium was left in place for three to eight hours. A total dosage of 5,000 millicurie-hours was given. Of 165 patients, 147 were traced. The three-year results were as follows: 45 per cent cures in the favorable cases, 12.1 per cent in advanced cases and 12.7 per cent in the whole group. External irradiation was not applied.

In Buffalo, at the State Institute for the Study of Malignant Disease, Schreiner last year reported his method as follows: roentgen treatment is begun on the day of admission, by giving 25 per cent dose at a depth of 10 cm. The following day, the patient is placed in the lithotomy position, is put under general anesthesia, and the cervix is dilated and is filled to the internal os with tandem tubes containing emanation. These tubes are 5 cm. long and the filtration consists of 0.5 mm. gold, 0.5 mm. brass, and 1.0 mm. rubber. The tubes are left in position for a total of 1,200 millicurie-hours for each tube. Biopsy is performed before the tubes are placed. The day following removal of the radium, more high-voltage roentgen ray is given to bring the total irradiation (including the radium) to 130 to 140 per cent skin erythema dose. The whole treatment takes four to seven days. Five-year cures were secured in 64.28 per cent of early cases, in 28.57 per cent of borderline cases, in 14.47 per cent of advanced cases, in 1.44 per cent of cases of massive growth, and in 5.40 per cent of recurrent cases. The series consisted of 293 patients. The mortality was less than 1 per cent.

In Cleveland, Pomeroy gives a general anesthetic, obtains biopsy and dilates the cervix, then fills the canal from fundus to external os with tubes of radium element screened with 0.5 mm. silver, 1 mm. brass, and 1.5 mm. rubber, usually 75 mg. for thirty-six hours, or 2,700 milligram-hours. Glass or gold emanation seeds are implanted into the cervix in addition, usually twelve seeds of 1 millicurie each, with a dosage of about 1,584 millicurie-hours. The maximal dosage is 6,000 milligram-hours and millicurie-hours. Two hundred twenty-seven cases are reported; the proportion of five-year cures was 80 per cent in early cases (only five cases), 17.24 per cent for the entire group. The lesion was adenocarcinoma in more than half of the cases in which cure was effected. External irradiation was not used.

Technic and results at The Mayo Clinic will now be considered. There have been frequent changes in method since the inception of the treatment of the clinic in 1915. As it now stands intensive fractional dosage is employed; a massive dose is applied over a period of two to three weeks. The cases are first classified anatomically, according to the extent of the lesion.[1] Early or operable lesions are those limited to the cervical canal or to a small portion of the face of the cervix, and that they are early lesions is verified by biopsy. In borderline cases the lesion involves the face of the cervix and usually has extended to the parametria. Inoperable lesions are those extending to the vaginal walls or infiltrating the broad ligaments, usually with fixation. The recurring cases are those in which the carcinoma has reappeared after adequate surgical or radiologic treatment. Modified lesions are those treated elsewhere with some form of operation or irradiation, which evidently has proved inadequate, since the patients come with evidences of their former trouble.

The cases are also classified as to the type of treatment applied: whether complete, incomplete, limited, abandoned, or prophylactic. At the first examination we endeavor to place the patient in one of these groups, exercising our radiologic judgment. If the general condition seems satisfactory and a chance of cure appears possible, we endeavor to give a complete course of treatment, consisting usually of approximately eight applications of radium over a period of two to three weeks. The radium is given intracervically, interstitially, within the uterus, and vaginally, followed by one, two or three courses of roentgen treatment. The 50-mg. universal tube, filtered through 1.5 mm. monel metal, or a tube containing 50 millicuries of radon, enclosed in 0.5 mm. of silver and 1 mm. of brass, is the usual radium applicator employed. The duration of each treatment is twelve to fourteen hours. The entire length of the cervical canal and uterus is treated, applying usually two treatments to each 2.5 cm. of canal. In large cauliflower growths, radium in platinum needles is implanted, distributing the energy equally throughout the mass. The vaginal applications are made to the face of the cervix and in each fornix; the radium, besides its covering of monel metal, is shielded by 2 mm. of lead and 1 cm. of Para rubber. Treatments are given under direct inspection, with the patient in the knee-chest position; anesthesia is not required, except that with intra-uterine applications and with implantation, a Number 2 tablet of hyoscine, morphine and cactine is given hypodermically. After the applicator is placed, the vagina is packed with gauze. When radium is placed in necrotic craters, the applicator is enclosed in 2 mm. of lead to minimize further necrosis by filtering out the rays of longer wavelengths.

One complete course of radium only is given, unless local recurrences occur. For debilitated and cachectic patients with massive lesions a limited or palliative treatment is outlined. Following surgical removal of growths the treatment is given vaginally and is prophylactic. "Abandoned" cases are those in which our judgment has been at fault; that is, complications have developed if patients have no reserve strength to endure the treatments prescribed for them and treatment has had to be discontinued.

Our five-year results were recently reported, and include all cases treated with radium from 1915 to 1924 inclusive.[2] One thousand ninety-four patients were seen and of this number 1,001 (91.50 per cent) were traced. In this same period 167 patients were seen and not treated because of recent treatments elsewhere, or the hopeless extent of the condition. One hundred thirty-two patients were treated by surgical excision without irradiation, chiefly in the earlier of the years reviewed. Of the 1,001 patients treated and traced, 75 per cent of the small group seen early obtained a five-year cure, as did 61.53 per cent of those with borderline lesions, 21.49

per cent of those with inoperable lesions and 24.82 per cent of those with modified lesions. Of all four groups, there was survival for five years in 23.87 per cent, in 23.15 per cent with the modified group excluded, and in 66.66 per cent of the early and borderline lesions together. Of 625 cases in which biopsy was performed, 92 per cent were of epithelioma, 7 per cent of adenocarcinoma, and 1 per cent of mixtures of the two. Further analysis disclosed that 76 per cent of the lesions were graded 3 or 4, 15 per cent were graded 1 or 2, and 9 per cent were not graded. Analysis of five-year results by grade of lesion revealed that the small group with adenocarcinoma had the best survival; in grades 3 and 4 of both epithelioma and adenocarcinoma the best five-year survivals were obtained except in the modified group. Our mortality in hospital for the ten-year period was 1 per cent.

Comparison of radiologic results with surgical results is difficult, because the percentage of cases regarded as "operable" differs markedly with different surgeons. One surgeon will accept 15 per cent of all cases for operation; another will operate on 70 per cent of all patients that consult him. The radiologists also differ in classification, but on the whole radiologists are sought by patients in a far more advanced and hopeless condition.

Heyman,[15] in a report in June, 1927, before the Scandinavian Surgical Society, summarized the surgical statistics from twenty surgical clinics throughout the world (5,024 cases) and the radiologic statistics of seventeen radiologic clinics (3,512 cases). The five-year results in this massive collection were as follows: surgical cures for all cases, approximately 18 per cent; radiologic cures, 16.3 per cent; cures for operable and borderline cases by operation 35.6 per cent and by radiologic treatment 34.9 per cent; primary mortality for all cases, after operation 17.2 per cent, and after radiologic treatment approximately 2.0 per cent. Moreover of the total number of patients seen in surgical clinics, the condition was considered to be in an operable stage in 43 per cent, whereas of the total number of patients seen in radiologic clinics, the condition was considered to be in an operable stage in less than 30 per cent.

These figures approach each other closely, but the difference in the character of the initial material should be taken into account. The radiologic results are based on far more advanced and hopeless lesions, as shown by the condition, as regards operability of patients seen in surgical and in radiologic clinics.

SUMMARY

In this rapid review of methods and results in the largest radiologic clinics, we have found great variation in method with fairly uniform results. With radium, treatments may be given in two hours, and also in a month of constant irradiation, with all gradations between these extremes. The method at The Mayo Clinic lies between the massive dose and the fractional dose and embodies some of the advantages of each. In many parts of Germany roentgen treatment alone is used successfully; the results are not duplicated in this country. In four large clinics only (Baltimore, Stockholm, Cleveland, and Boston) radium is used without the help of roentgen rays.

In July, 1924, Greenough published the Report of the Committee on Treatment of Malignant Diseases with Radium and Roentgen Rays. Greenough's summary contained the information that in early and favorable cases of carcinoma of the cervix the choice between radium and operation is an open one. In advanced cases, the value of radium as a palliative measure is beyond dispute. In cases recurrent after hysterectomy, and in cases of carcinoma of the cervical stump, radium is the treatment of choice.

It must be remembered that either form of treatment, irradiation or operation, can effect cures only if the disease is local; if distant metastasis has occurred, surgery has nothing to offer, whereas irradiation may yield considerable palliation.

BIBLIOGRAPHY

1. Bowing, H. H., and Fricke, R. E.: Radium treatment of carcinoma of the cervix during 1927. Am. Jour. Roentgenol. and Radium Therap., 21:529-537 (June), 1929.
2. Bowing, H. H., and Fricke, R. E.: Results obtained in the treatment of carcinoma of the cervix uteri with radium and roentgen rays from 1915 to 1924 inclusive. Radiology, 14:211-216 (March), 1930.
3. Cade, Stanford: Radium treatment of cancer. New York, Wm. Wood and Co., 1929, 158 pp.
4. Cancer Commission: Reports submitted by the Radiological Sub-commission. Geneva, Series of League of Nations Publications, iii, Health, 1929, iii, 5, 82 pp.
5. Chéron, D. H.: De la radiumthérapei des fibromes

utérins. Arch. d'élect. méd., 19:353-363 (April), 1911.

6. Clark, J. G., and Norris, C. C.: Radium in gynecology. Philadelphia, J. B. Lippincott Co., 1927, 315 pp.
7. Döderlein, Albert, Döderlein, Gustav, and Voltz, Friedrich: Über das Uteruskarzinom und seine Strahlenbehandlung. Acta Radiol., 6:335-362, 1926.
8. Dominici: Quoted by Lynch, F. W., and Maxwell, Alice F.: Pelvic neoplasms. New York, D. Appleton and Co., 1922, p. 264.
9. Forssell: Quoted by Heyman.[14]
10. von Franqué: Quoted by Lynch, F. W., and Maxwell, Alice F.: Pelvic neoplasms. In: Gynecological and Obstetrical Monographs. New York, D. Appleton and Co., 1925, Appendix, p. 126.
11. Fürst, Walter: Zur Frage der Strahlenbehandlung der Collumkarzinoma. Zentralbl. f. Gynäk., 50:1938-1945 (July 24) 1926.
12. Greenough, R. B.: The treatment of malignant diseases with radium and x-ray—cancer of the cervix. Surg., Gynec. and Obst., 39:18-26 (July), 1924.
13. Healy, W. P.: Carcinoma of the cervix. Radiology, 14:217-222 (March), 1930.
14. Heyman, James: Experiences with a modification of the technic hitherto used at Radiumhemmet in the radium treatment of cancer of the cervix. Acta obst. et gynec. Scandin., 9:259-266, 1930.
15. Heyman, James: Radiology as a complete or partial substitute for surgery in treatment of cancer of the female pelvic organs. Surg., Gynec. and Obst., 50:173-183 (Jan.), 1930.
16. Kelly, H. A., and Burnam, C. F.: Radium in the treatment of carcinomas of the cervix uteri and vagina. Jour. Am. Med. Assn., 65:1874-1878 (Nov. 27), 1915.
17. Kelly, H. A., and collaborators: Gynecology. New York. D. Appleton and Co., 1928, pp. 929-954.
18. Leland, G. A.: Massive dose radium treatment in carcinoma of the cervix uteri. Am. Jour. Roentgenol and Radium Therap., 12:373-378 (Oct.), 1924.
19. Lenz, Maurice: Radiotherapy of cancer of the cervix at the radium institute, Paris, France. Am. Jour. Roentgenol. and Radium Therap., 17:335-342 (March), 1927.
20. Oudin and Verchère: Du radium en gynécologie. Compt. rend Acad. de sc., 143:90-92, 1906.
21. Pomeroy, L. A.: Five-year end-results of radium treatment in carcinoma of the cervix uteri. Am. Jour. Roentgenol. and Radium Therap., 18:514-519, (Dec.), 1927.
22. Regaud, Claude: Traitement des cancers du col de l'utérus par les radiations. Soc. internat. de chir., 1:34-146 (April), 1926.
23. Regaud, Claude: Radium therapy of cancer at the radium institute of Paris. Am. Jour. Roentgenol. and Radium Therap., 21:1-24 (Jan.), 1929.
24. Schmitz: Quoted by Clark and Norris.
25. Schmitz, Henry: The technic of the treatment of carcinoma of the cervix uteri with a combination of x-rays and radium rays. Am. Jour. Roentgenol. and Radium Therap., 10:219-229 (March), 1923.
26. Schmitz, Henry, and Hueper, William: Histological structure, clinical grouping, and prognosis of cancer of the uterine cervix and the breast. Radiology, 14:223-231 (March), 1930.
27. Schreiner, B. F.: End-results of radium treatment in epithelioma of the cervix uteri based on a study of 374 cases—1914 to 1923 (inclusive). Radiol. Rev., 51:141-147 (April), 1929.
28. von Seuffert: Quoted by Lynch, F. W., and Maxwell, Alice F.: Pelvic neoplasms. In: Gynecological and Obstetrical Monographs, New York, D. Appleton and Co., 1925, Appendix, p. 120.
29. Simmons, C. C.: Personal communication to the authors.
30. Stevens, J. T.: Management of carcinomata of the uterine cervix. Radiology, 12:423-428 (May), 1929.
31. Ward, G. G.: Radium therapy of carcinoma uteri. Am. Jour. Obst. and Gynec., 17:1-13 (Jan.), 1929.
32. Wickham: Quoted by Lynch, F. W., and Maxwell, Alice F.: Pelvic neoplasms. New York, D. Appleton and Co., 1922, p. 264.
33. Wintz, Herman: Ergebnisse der Strahlenbehandlung beim Uteruscarcinom und Mammacarcinom. Strahlentherapie, 33:456-466, 1929.

THE RELATIONSHIP OF EPILEPTIC SEIZURES TO BRAIN TUMOR*

Harry L. Parker, M.B. (Dublin)
Rochester, Minnesota

In the course of examination of patients seeking aid primarily because of epileptiform convulsions, there is the constant fear that sooner or later some of these patients may have signs of tumor of the brain. In the minds of both the lay public and the medical profession, a diagnosis of epilepsy seems to represent an unpardonable blunder if the patient later shows indications of gross cerebral disease. Further, in making a diagnosis of epilepsy it is usually assumed by both examiner and patient that not much can be expected in the future other than recurrent convulsive attacks. The question might be asked: How often does a convulsive seizure occur as the initial symptom in cases of cerebral tumor and is it possible for such seizures to continue over a long period before signs of tumor appear? Conversely, it is of interest to know the frequency with which cerebral tumors are found either before or after death in both institutionalized and non-institutionalized cases of epilepsy.

In a recent contribution on the subject[3] it was demonstrated that in a series of 313 patients suffering from cerebral tumor, sixty-seven (21.6 per cent) were found to have had generalized epileptiform convulsions some time during the course of the disease. It is noteworthy from the present standpoint that of these sixty-seven patients there were thirty-eight whose initial symptom was the convulsion. Fifteen patients, however, simultaneous with or even shortly after this initial convulsion, manifested unmistakable signs of tumor of the brain. It is obvious, therefore, that there might be no risk in making an erroneous diagnosis in cases in which signs of gross cerebral disease developed more or less rapidly shortly after the initial convulsion. Twenty-three patients had had a period of illness of varying length before the appearance of symptoms of tumor. During this period symptoms other than convulsions had not appeared. Ten of these patients suffered the usual course of symptoms of cerebral tumor within a year. Finally, a group of thirteen cases was isolated in which convulsive seizures had occurred for more than a year without any clue as to the real nature of the disease. This represents 4.1 per cent of the total series. In three cases seizures had occurred for many years before any other symptoms appeared. In the remaining ten cases the average time during which other manifestations than epileptiform attacks had not occurred was five and six-tenths years. It is probable that in all of these thirteen cases a diagnosis of epilepsy had been made years before the true nature of the trouble was suspected.

ABSTRACTS OF ILLUSTRATIVE CASES

Case 1.—A man, aged fifty-nine years, came to The Mayo Clinic February 16, 1922, because of convulsions and failing mentality. Twenty-six years before, he had begun to have convulsive attacks, usually at night when he was asleep. At first these attacks were three or four years apart; they gradually became more frequent until they had been about a week apart for the previous two years. Usually during attacks the patient bit his tongue and lost control of his urine. Six months before he came to the clinic the attacks changed in character and time of onset. Instead of generalized convulsions, he had short periods of loss of consciousness, usually lasting one to two minutes, during which he looked blank, stared straight ahead and acted in an automatic fashion and was usually confused for a half hour afterward. For a year he had noticed failing memory and difficulty in concentration. He had become increasingly irritable, and started quarrels at the least provocation. Several times during the previous year he had found himself in parts of the packing plant where he worked where he had no business and had wondered how he had got there. His wife stated that his mentality had become feeble and he had a tendency to talk at random and incoherently.

There was a fine tremor of both hands. All tendon reflexes were exaggerated. Speech was indistinct and there was a certain degree of paraphasia. Intelligence, coöperation and attention were considerably reduced. Roentgenograms of the skull showed a large osteoma in the frontal region involving the greater part of the left and the right frontal bones, but chiefly the left. There was no weakness of either side of the body and ophthalmoscopic examination of the eye grounds was negative. A diagnosis was made of osteoma of the frontal bone with underlying meningioma.

Craniotomy was done February 25, 1922. A huge meningioma was found 9 cm. in diameter arising from the left side of the falx cerebri, just above the left frontal sinus. It was extremely hard and filled with psammoma bodies. It had invaded the frontal bone. The patient recovered from the immediate effect of the operation and seemed to be getting along well when fever developed suddenly, with swelling and redness over the left eye and bridge of the nose. His neck became rigid. He was at first confused, then became comatose and died two days later, eleven days after the operation. Necropsy revealed the terminal cause as acute septic cerebrospinal meningitis.

---

*From the Section on Neurology, The Mayo Clinic, Rochester, Minnesota. Read before the Southern Minnesota Medical Association, Mankato, August 25, 1930.

Comment.—The interest in this case lies in the length of time before anything but epileptiform attacks became manifest. Grand mal became replaced by petit mal in the last six months of the patient's illness and it was only in the last year of the period ranging over a quarter of a century that other symptoms of a gross lesion of the brain became manifest. It might be argued that this was a case of so-called idiopathic epilepsy in which tumor of the brain had become superimposed. However, the type of tumor is that recognized as being extremely slow in growth, and, considering its relatively large size, twenty-six years was not too long for its life history. It had probably been present even longer.

Case 2.—A man, aged fifty-nine years, came to The Mayo Clinic May 16, 1926, because of convulsive attacks and increasing weakness of the left side of the body. Sixteen years previously, seizures had developed in which the left hand and arm would flex toward the mouth and be held then in tonic contraction. Relaxation would occur in less than a minute and the patient would appear normal again. These attacks might occur ten or twelve times a day, with a free period of from two to three weeks. There was no loss of consciousness. Eleven years before the tonic contractions took in the muscles of the head and face, the head and eyes would turn to the left and the face would contract. Six years before his admission to the clinic, the attacks changed in character and became more severe. Clonic jerkings appeared which progressed from the hand to involve the whole left side of the body or from the foot to the rest of the left side. Usually toward the end of the seizure consciousness was lost but was regained in from three to five minutes. One year before admission, progressive weakness, beginning in the left foot, had spread to affect the rest of the body. Memory had become poor, incontinence of bowels and bladder occurred, and the patient became confined to bed three or four weeks before he came to the clinic.

The patient was dull, apathetic and drowsy; he answered questions poorly and had an obvious memory defect. There was complete paralysis of the left side with ankle and wrist clonus, and Babinski's sign was present on plantar stimulation. There were apparently no sensory changes in the limbs affected. Roentgen examination of the skull was negative and changes could not be found in the eye grounds or visual fields. Spinal puncture showed clear fluid under pressure of 16 cm. of water with 1 small lymphocyte for each cubic millimeter of fluid. The Wassermann reaction of the blood and spinal fluid was negative. A diagnosis was made of subcortical tumor in the right cerebral hemisphere underlying the motor cortex.

June 2, craniotomy was performed with exploration of the brain. A purplish-red tumor with a definite outline was found to be approaching the surface of the brain in the right frontal and parietal regions. No attempt was made to remove it, but decompression was done. The patient died suddenly the second day after operation. Necropsy revealed a large glioma of the corpus callosum in the frontal region which had extended into the frontal, parietal and temporal lobes.

Comment.—The convulsions in this case were much more suggestive of gross cerebral disease. At the onset these were tonic and involved the left upper extremity. However, for ten years no other manifestations appeared and presumably general examination during this long time showed nothing abnormal. In the last six years the convulsions were more jacksonian in character. I have been led to believe that simple tonic contractions of one extremity lasting a relatively short time indicate a subcortical process. Later, as the tumor reached the surface, cortical irritation was characterized by jacksonian attacks. Finally, in the last year paralytic symptoms appeared and diagnosis was no longer difficult. The tumor was also different, being gliomatous in character but again of excessively slow growth.

Case 3.—A woman, aged thirty-eight years, came to The Mayo Clinic February 2, 1927, because of convulsions and headaches. For ten years she had lost consciousness once or twice a year: the longest interval between the attacks had been two years. The attacks were preceded by an aura of inability to talk which lasted about a minute, was followed by a turning of the head to one shoulder, loss of consciousness and falling. During the attacks she was cyanosed and had clonic jerking of all extremities. Occasionally she did not sleep, and then slept soundly for several hours. There had also been a few minor attacks consisting of transitory loss of speech. A year before she came to the clinic occipital headaches appeared; these increased in frequency and severity and became associated with vomiting. Two weeks before examination she had noticed slight blurring in vision in reading and writing and occasionally transient diplopia.

The patient was well developed and well nourished, not apparently acutely ill, and there were no signs of mental impairment. Ophthalmoscopic examination showed acute papilledema of about 4 diopters in both optic disks. Roentgenograms of the skull showed slight enlargement of the sella turcica with thinning of the posterior clinoid processes. Tendon reflexes were increased on the left side of the body; there was slight loss of speed on that side, and although the gait showed nothing unusual the patient could not hop as well on the left limb as on the right. A diagnosis was made of tumor of the cerebrum in the right frontotemporal region.

Craniotomy was performed February 15, 1927. A large subcortical tumor was found. No attempt was made to remove it, but decompression was done. The patient died three days later. Necropsy showed a large, subcortical glioma of the brain in the left frontoparietal region.

Comment.—In nine years this patient had had seizures that resembled epilepsy; then the headaches and visual disturbance gave a clue as to the nature of the disease. The aphasic type of aura might have led to a suspicion of tumor, since this is not common in cases of epilepsy, but at the outset the diagnosis was difficult and the period of waiting for further developments was necessarily a long one. Ventriculography or encephalography would have helped in this case had the true condition been suspected early.

Case 4.—A man, aged forty-one years, came to The Mayo Clinic August 2, 1923, because of convulsive attacks. He stated that he had had these for nine years and although at first they came two or three times a month they had gradually increased to the same number in a day. They occurred both during the day and at night. Usually he had a warning in the form of a peculiar sensation in the forehead and eyes, lasting a half minute to two minutes. Sometimes he sat or stood while unconscious, but frequently he fell, bit his tongue, and urinated and defecated involuntarily. A few weeks before examination he had had eight attacks in twenty-four hours. Occasionally frontal and orbital headaches occurred after the attacks, but otherwise headaches were not persistent or severe. His greatest concern was his inability to hold a position as printer, for his employers were afraid of his being injured by machinery during these attacks. Except for these seizures he felt perfectly well and had had no mental disability.

The patient came to the clinic alone and there was no opportunity to get a description of his seizures. At the first examination he seemed physically well and was advised to return for completion of examination the next day. After an absence of three days he was admitted as an emergency case to the hospital in a stuporous condition. According to his landlady, he had apparently been well the first day, although depressed. The second day he complained of severe headache and remained in bed most of the day. The third day he was worse, did not take food and complained bitterly of headache and nausea. The day of his admission to the hospital he had become drowsy and stuporous, vomited and had a convulsion.

In the hospital the patient did not talk and responded poorly to stimulation. Ophthalmoscopic examination showed the right optic disk to be slightly elevated on the nasal side but the left optic disk was normal. The pupils did not respond to light, all tendon reflexes were active and equal, there was no muscular weakness, and Babinski's sign was absent. The stupor increased throughout the day and the patient died in the evening without regaining consciousness. Necropsy showed a hemorrhagic, cystic glioma of the left temporal and frontal lobes. There had been a terminal hemorrhage into the tumor.

Comment.—This type of death is by no means uncommon in cases of tumor of the brain. The rapid and sudden change in the patient's condition is extremely disconcerting when a diagnosis of epilepsy has been made and a grave prognosis has not been offered. However, in spite of this case and Cases 1, 2 and 3, it must be insisted that in most cases such a sequence of events is fortunately not the rule. The more usual situation is illustrated in Case 5.

Case 5.—A woman, aged fifty-six years, first came to The Mayo Clinic June 7, 1922, complaining of convulsive attacks, epileptiform in character. She had had her first convulsion two years before. The attacks occurred every three months, were moderately severe, but symptoms were absent between attacks, except for slight failure in memory. She did not remain at the clinic to complete her examination. A diagnosis was not made. The patient was seen again January 25, 1925. This time, however, she was brought to the clinic in an ambulance and was in deep stupor. In the interval the attacks had become more frequent and more severe and were preceded by transitory unpleasant tastes and odors. A year before this admission the attacks had ceased suddenly and had remained absent for eight months, but mentally the patient became dull, forgetful and apathetic. Two months before the second visit all symptoms returned and were more severe. Headaches, nausea and vomiting came between the convulsions, and, following a more severe convulsion a few days before admission, complete left hemiplegia had developed with progressive stupor and involuntary urination.

Examination was limited because of the stupor, but complete flaccid paralysis of the left side of the body was noted. Eye grounds were normal and the spinal fluid was not under great pressure. Because of the history of convulsions with olfactory and gustatory aura, the left hemiplegia and progressive downward course, a diagnosis was made of tumor in the right temporal lobe. The patient died four weeks later and necropsy proved this diagnosis to be correct.

Comment.—In this case the period of convulsions as a solitary symptom of tumor of the brain was only three years. The whole course of the disease, as judged by symptoms, was four and a half years. Presumably a correct diagnosis could have been established during the last eighteen months, and possibly earlier, for the increase in frequency and severity of convulsions and the appearance of uncinate symptoms would have indicated a progressive gross cerebral disease, and very soon other signs appeared which would have confirmed the suspicion.

GENERAL COMMENT

The relatively long period these patients had convulsions before any other symptoms appeared and the exact relationship of the tumor to the convulsive seizures are problems of interest. In a previous study[3] emphasis was placed on the relatively small number of cases in which convulsive seizures occurred during the course of intracranial tumor. This is actually only 21.6 per cent of the 313 cases, and for every case in which convulsions were associated with the tumor of a certain character in a certain situation, one or more other cases could be demonstrated of an identical nature, but convulsions had never been a prominent symptom. It may be assumed, therefore, that although convulsive seizures are relatively more common in cases of intracranial tumor than in the general run of disorders, some other factor than the tumor itself must be held responsible for the appearance of the convulsions. Four and one-tenth per cent represents the greatest number of cases of tumor that might have been mistaken in the beginning for cases of epilepsy.

From the standpoint as to the relative incidence of tumor in cases that have been diagnosed as epilepsy, some interesting figures are now available. In necropsy cases at Craig Colony cerebral tumor was found to be present in 2 per cent, and in a group of necropsy cases in Australia the incidence was 3.5 per cent. Lennox and Cobb, in a recent article drawn from the study of a large number of non-institutionalized, adult epileptic patients, have found the incidence of tumor to be 3.5 per cent. Therefore, if an adult patient has had convulsions for a relatively short time without manifest signs or symptoms of disease other than convulsions, the possibility of the presence of tumor cannot be estimated as more than from 3 to 4 per cent. Obviously the shorter the history and the fewer the convulsions the more guarded should be both diagnosis and prognosis. It is better to confess ignorance and doubt than to proceed to label the condition with a hard and fast diagnosis that is to last for all time. If tumor is suspected, the diagnosis may be confirmed early and well in advance of clinical signs and symptoms by ventriculography and encephalography. This, however, cannot be recommended as a routine procedure in all cases of convulsive seizures and these tests carry their own fallacies and possibilities of misinterpretation. A more conservative plan of waiting and frequent, careful examinations with an open diagnosis is wiser in cases of adult patients in which convulsive seizures have developed recently. At no time should the possibility of tumor be forgotten and an effort should be made to exclude its presence by careful examination. At the same time it is of some comfort to know that the margin of error is no more than between 3 and 4 per cent and there is plenty of time in which to make a correct diagnosis. In the majority of cases of cerebral tumor a diagnosis is possible early, and correspondingly in most cases in which epilepsy has been diagnosed the possibility of tumor is not great.

BIBLIOGRAPHY

1. Lennox, W. G., and Cobb, Stanley: Epilepsy. Baltimore, Williams and Wilkins Company, 1928, 186 pp.
2. Lennox, W. G., and Cobb, Stanley: The noninstitutional epileptic: A preliminary report of the Association's coöperative study. Unpublished data.
3. Parker, H. L.: Epileptiform convulsions: The incidence of attacks in cases of intracranial tumor. Arch. Neurol. and Psychiat., 23:1032-1041 (May), 1930.

BACKACHE FROM THE ORTHOPEDIC VIEWPOINT*

Ralph K. Ghormley, M.D.
Rochester, Minnesota

WHETHER or not modern methods of living have actually increased the incidence of the complaint "backache" cannot be determined. It may be surmised that riding in automobiles has caused at least a small increase in the number of such cases. In order to furnish a basis for considering this complaint, I have reviewed 100 consecutive cases of pain in the back; it was not the chief complaint in all cases, but in most it was one of the major complaints.

Forty per cent of the patients were men and sixty per cent were women; about 75 per cent were between the ages of thirty and fifty years and none was aged less than twenty years. Although statistics would vary in a larger series of cases, they nevertheless furnish a fair basis for comparison (tabulation).

TABULATION

CAUSES OF PAIN IN 100 CASES OF BACKACHE

		Cases
Sacro-iliac affections		32
Lumbosacral affections		23
Lumbosacral strain	9	
Anomalies of the fifth lumbar vertebra	4	
Narrow fifth lumbar disk	4	
Calcified iliolumbar ligaments	4	
Spondylolisthesis	2	
Arthritis (including spondylitis deformans)		24
Postural strain		5
Old fractures		4
Old Pott's disease		3
Scoliosis		2
Adolescent round back		2
Paget's disease		1
Congenital anomaly of the first, second and third lumbar vertebræ		1
Metastatic malignant disease		1
Congenital anomaly of sacrum		1
Tumor of the cauda equina		1

SACRO-ILIAC AFFECTIONS

The predominance of sacro-iliac affections is not as great as would seem to be indicated, because several cases have been included in which the lumbosacral as well as the sacro-iliac joints appeared to be affected. Cases are included of arthritis and of strain, unilateral and bilateral. Accurate distinction between strain and arthritis in these joints is often difficult, unless the arthritis is a part of generalized arthritis of the spine. More often the arthritis is traumatic, due to the long-continued strain to which these joints are subjected, and in most cases of so-called strain originate in early arthritis of traumatic origin. The symptoms of this condition are not always clearly defined.

The most significant physical signs are pain localized over one or both sacro-iliac joints with or without sciatic radiation, tenderness on pressure over the posterior sacro-iliac ligaments, and over the region supplied by the superior gluteal nerves, pain on internal rotation of the femur on the side affected due to the pull on the external rotators of the hip joint which attach across the sacro-iliac joint, and limitation of straight leg raising; the last is usually dependent on the presence or absence of sciatic pain with its accompanying spasm of the hamstring muscles. In the more acute cases there is usually a good deal of spasm of the erector spinæ muscles and there may be a lateral list of the spine, usually away from the side affected (sciatic scoliosis). An almost constant observation in such cases is pain on pressure over the anterior sacro-iliac ligaments on rectal examination. The roentgenogram is not particularly helpful in making a diagnosis. In good stereoscopic pictures changes can be detected in many cases, but a single flat roentgenogram is often misleading and too much stress should not be placed on its interpretation.

LUMBOSACRAL AFFECTIONS

In many cases signs pointing to involvement of the lumbosacral joint accompany signs of sacro-iliac affection. Usually there is tenderness over the fifth lumbar spinous process on heavy percussion and there may or may not be tenderness laterally over the transverse processes. These lie deeply imbedded beneath the muscles, and pressure there, except if subjects are thin, is often not the cause of pain. Many believe, however, that the distinction between sacro-iliac and lumbosacral lesions cannot be clearly drawn in some cases. This no doubt is true because of the complex ligamentous structure holding these joints together. It is easy to see how strain or arthritis involving one joint may throw an added burden on the other joints and thus produce symptoms referable not only to the original joint, but to both of the others.

---

*From the Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Southern Minnesota Medical Association, Mankato, August 25, 1930.

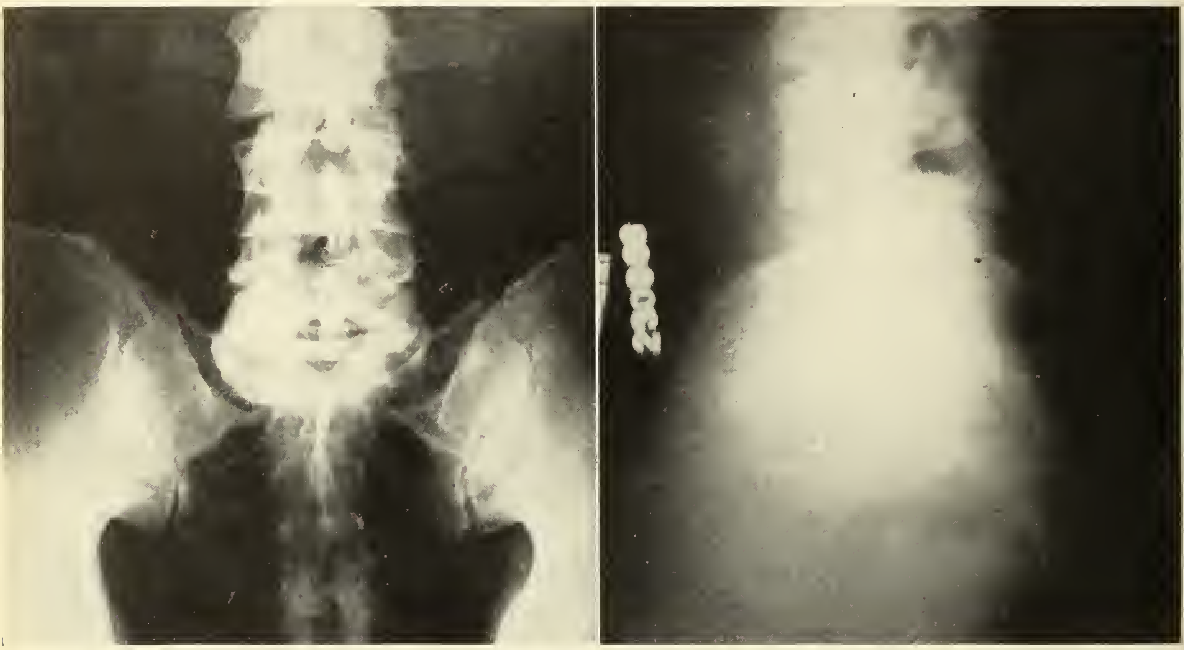


Fig. 1. The roentgenograms show narrowing of the intervertebral disk between the fifth lumbar vertebra and the sacrum, and also some change between the fourth and fifth lumbar vertebræ.

Congenital anomalies of the lumbosacral area are: sacralization, either unilateral or bilateral, spina bifida, anomalies of the articular facets between the fifth lumbar vertebra and the sacrum (Goldthwait), and anomalies in the laminæ. All of these have been considered as etiologic factors. I believe that spina bifida, except in the presence of actual change in the nerves, is rarely, if ever, the cause of backache. Sacralization may be the cause, but sacralization produces a firmer type of joint, and careful examination of a good lateral roentgenogram usually shows the fifth lumbar vertebra fused to the sacrum. This would exclude any possible motion except between this joint and the vertebra above.[2] Anomalies of the laminæ causing weakening, which some observers believe to be the cause of spondylolisthesis, can only be demonstrated in the best stereoscopic roentgenograms. Keith stated that there is no evidence to suppose that the separation of the arch of the last lumbar vertebra is the result of maldevelopment. Keith also considered the evolution of the human spine, pointing out that from the quadruped posture to the erect posture many important changes have taken place, among which are the shortening of the lumbar trunk and the widening of the pelvic base. This process of evolution is perhaps not complete. It is because of this that so many anomalies are found in this region. The trunks of our predecessors were longer and not so heavily built. The sacrum was placed more on a plane with the rest of the spinal column. In the change from the horizontal to the erect posture a much greater strain has been thrown both on the lumbosacral and on the sacro-iliac joints. Lumbar lordosis has developed; in some cases it is exaggerated so that the angle between the sacrum and the lumbar portion of the spinal column is almost a right angle. This no doubt places an undue strain on the ligaments supporting this area and tends to produce strain. These evolutionary changes, therefore, must be recorded as definite predisposing factors in many of these cases of low backache.

Another condition met with frequently enough to warrant special consideration is partial destruction of the intervertebral disk between the fifth lumbar vertebra and the sacrum (Figs. 1 and 2). This condition was noted in four cases of the series. Trauma is usually the cause; a severe injury may cause partial rupture of the disk which is not recognized at the time, but which gradually leads to diminution in the thickness of the disk with probable fibrosis of the cartilage. Often in such cases there is a history of recurrent attacks of pain, rather severe at the time and clearing up in two or three days. Except for tenderness over the lumbosacral area and more or less spasm of the lumbar muscles, the results of general examination are negative and a lateral roentgenogram centered over this area must be relied on to make the diagnosis. The pathologic change in these cases must be similar in many respects to that seen in spondylolisthesis; hence the treatment should be similar. In many of the cases a brace or high-backed belt or corset will suffice, although a fusion type of operation is indicated.[1]

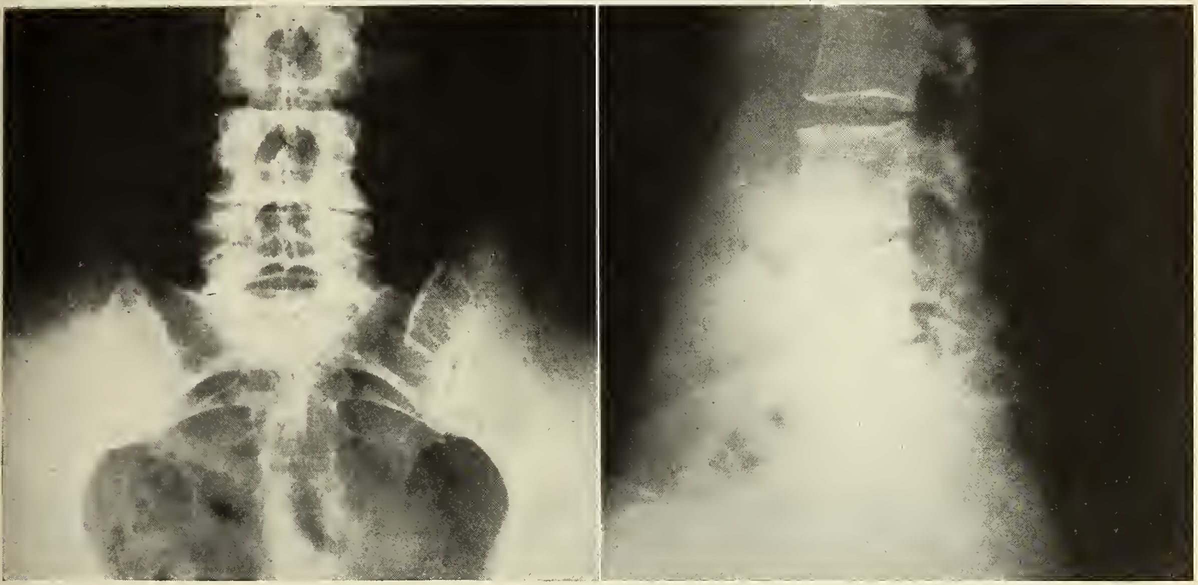


Fig. 2. Narrowed disk between the fifth lumbar vertebra and the sacrum with some calcification along the margin of the disk, best shown in the anteroposterior view.

In the anteroposterior view of the lumbosacral portion of the spinal column one may occasionally see a definitely calcified band running from the transverse processes of the fifth lumbar vertebra to the iliac crests. The iliolumbar ligaments are heavy structures whose attachments are such that they support the fourth and fifth lumbar vertebræ, as well as the upper portion of the sacrum, acting as slings with their attachments to the anterior surface of the ilium. The exact significance of this calcification is not clear, but the fact that it is usually seen associated with pain low in the back, particularly referred to the iliolumbar angle, is of considerable importance in their interpretation.

Spondylolisthesis was found in two cases of the series. In one of the cases it appeared to be superimposed on a congenital anomaly. In the other case traumatism was the cause. The diagnosis in the more severe types of the condition is usually not difficult, even without roentgenologic examination. In all cases it should be discovered in a good lateral roentgenogram centered over the lumbosacral joint. The treatment should be operative with an autogenous bone transplant. A brace may relieve the pain, but usually it has to be worn indefinitely.

ARTHRITIS OF THE SPINE (INCLUDING SPONDYLITIS DEFORMANS)

Arthritis was diagnosed in twenty-four cases. The term arthritis refers to at least three types:

The first type is so-called hypertrophic arthritis or osteo-arthritis, in which the roentgenogram shows hypertrophic spurs about the margins of the vertebral bodies and around the articular facets. These hypertrophic changes are significant. They may often occur without symptoms. However, when a more or less severe strain is superimposed on such a spine symptoms are produced and treatment must be commenced. Usually the pain occurs after periods of rest, and wears off after periods of activity.

In the second type are cases in which the roentgenograms show, besides a moderate amount of spur formation, a definite atrophic condition of the vertebral bodies, which is not clearly understood. It is not entirely due to disuse. It usually occurs in older persons and may in the more advanced cases be accompanied by a pathologic fracture. It is not typical osteomalacia, although it has some resemblance to this condition.

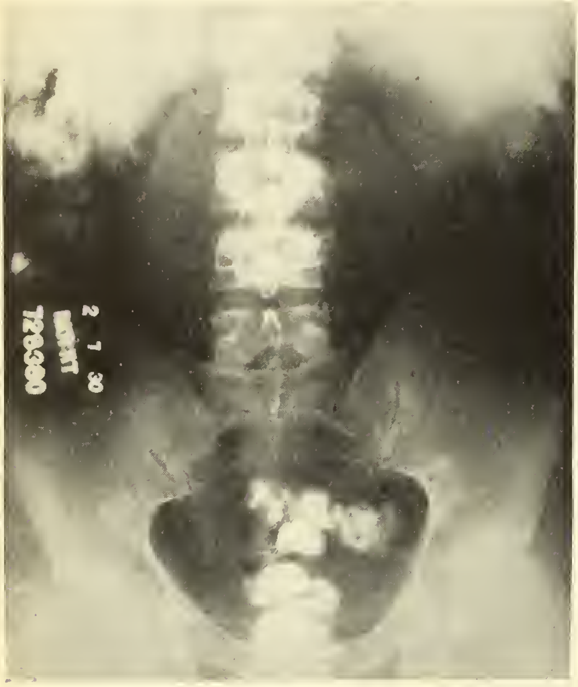


Fig. 3. Arthritis of the lumbar spine, gonorrheal in origin. Changes in the articular facets of the third and fourth lumbar vertebræ on the left may be noted.

The third type is again quite different in that its change is primarily in the ligaments, which by almost complete calcification finally fuse the spine into one solid rod. I refer to what is usually spoken of as spondylitis deformans of the Marie-Strümpell type. Little is known about the etiology of this condition, although it is classified as arthritis. The process is usually confined to the spinal column and sacro-iliac joints. The change is apparently primarily in the ligamentous structures, which become calcified. Subsequently the intervertebral disks and articular facets become involved. The end-result is the "poker spine." The main complaint is stiffness. Pain is usually not severe although it may be quite troublesome. One case is of special interest because of its unusual character.

A man, aged thirty years, following acute urethritis seventeen months previous to his admission to The Mayo Clinic, had had active acute arthritis of the right knee. At about the same time he had had severe pain in the lumbar region which lasted about two weeks and then subsided. Since that time he had had occasional attacks of rather severe pain in the lumbar region for two or three days. Examination disclosed rather marked limitation of motion of the lumbar portion of the spine, but without much tenderness or pain. The roentgenogram (Fig. 3) revealed a rather unusual picture. In the stereoscope one could see actual destruction of one articular facet and partial destruction of another. Also there was considerable periosteal proliferation about that area. Because of the coincidence with what seemed to be typical gonorrheal arthritis of the knee it was felt that this was of the same origin involving the articular facets of two lumbar vertebræ.

POSTURAL STRAIN

Five cases are classified in this group. In the main there are two types of backache due to faulty posture: that experienced by the large heavy person with a heavy abdomen, causing a constant drag on the ligaments and producing symptoms, and that experienced by the thin person with poor musculature who stands with round shoulders and marked lordosis. In many of the other conditions also, posture plays a certain part in the production of symptoms, since many of these patients are relieved when the strain of standing is removed. One may easily be too much inclined to regard faulty posture as the cause of many backaches, but it does no doubt exist as a factor and postural exercises carefully supervised will be of help in many cases.

OLD FRACTURES

In four cases of the series old compression fractures of the vertebræ were present. Two were in the midthoracic region and two in the thoracicolumbar region. In only two cases was the pain severe, and in these the condition had not been recognized previously. Owing to radiation of pain the complaints had been of abdominal distress. In such cases a lateral roentgenogram of the thoracicolumbar portion of the spine may clear up the diagnosis at once. It may be wise to operate in a few cases, although in many cases a brace and baking and massage over a period of a few weeks afford relief.

OLD POTT'S DISEASE

Old Pott's disease was discovered in three cases. In one case the symptoms were mild, the condition having apparently healed spontaneously.

In the other two cases symptoms had existed for a year or more. The pain in tuberculous spondylitis is rarely severe and may often be endured for months before the patient consults a physician, usually on account of deformity. The stage of deformity, however, is too late in which to get the best results from treatment, which should be operative on adult patients unless contra-indicated by other complicating conditions.

MISCELLANEOUS CONDITIONS

Scoliosis with nerve root pain, adolescent round back, Paget's disease, wedged vertebræ due to congenital anomaly, metastatic malignant disease, congenital anomaly of the sacrum with secondary changes in the cauda equina, and tumor of the cauda equina were among other conditions discovered. These conditions are not common, it is true, but they may be considered as possibilities. Malignant disease should always be suspected when intractable pain is present. It is the most persistent and the most severe type of pain in lesions of the spinal column. It usually does not respond to rest or fixation of any type and often can only be controlled by heavy doses of opiates or by cordotomy.

Tumor of the cauda equina should be a reminder that the central nervous system should be considered in all cases of backache. Neurologic consultations were called for in twenty-six cases of the series. Positive data other than sciatica were found in two cases only. Neurologic examination made as a routine in all cases would be desirable, but as one becomes more familiar with such cases it is possible to select the suspected neurologic cases. In many cases of sciatica such examinations are done. If the pain is not typically sciatic or if it is felt that the diagnosis is not adequate, the neurologist should be consulted.

TREATMENT

In general the same principles of treatment apply to the spinal column as to other joints, such as rest either by fixation by some form of splint or support, or in bed, and traction, heat and massage properly applied. No particular type of support is recommended. Women may wear a good, properly fitted corset. The use of extra pads and straps is not necessary, but it is important to have an exact fit. In cases of sacro-iliac affections a belt around the pelvis helps greatly. In cases of lumbosacral affections it is necessary to run the support up along the lumbar portion of the spine to the thoracicolumbar region. The use of physiotherapy is usually indicated. Baking, massage and graduated exercises are the most helpful procedures in this line.

What is more important perhaps than the type of support used, is the reassurance given the patient that his condition is not serious, and that he can be cured. His activities must be regulated and his coöperation must be secured. Too many such patients go from one physician to another and to osteopaths and chiropractors, and thus their troubles are prolonged. They must be made to realize this, and when they do realize it they will be better satisfied and will respond to treatment more quickly.

There is a decided tendency toward operative treatment of the lumbosacral and sacro-iliac disorders. The wide variety of opinions among orthopedic surgeons regarding such operation can mean only that the surgeons are dissatisfied with the operative results. Excellent results may be obtained from operative treatment, but cases must be carefully selected and accurate diagnosis must be made. Even then the question arises: will the patient get well on the long postoperative regimen which is essential if operation is not performed?

BIBLIOGRAPHY

1. Ayers, C. E.: Lumbo-sacral backache. New England Jour. Med., 200:592-608 (March 21), 1929.
2. Brackett, E. G.: The treatment of disabilities resulting from low back derangements. Jour. Bone and Joint Surg., 12:325-332 (April), 1930.
3. Keith, Arthur: Man's posture: its evolution and disorders. Brit. Med. Jour., 1:499-502 (March 4), 1923.

THE IMPORTANCE OF TOXIC GOITER COMPLICATING OR COMPLICATED BY OTHER CONDITIONS REQUIRING SURGICAL INTERFERENCE*

CHARLES MAYO, 2nd, M.D.
Fellow in Surgery, The Mayo Foundation
Rochester, Minnesota

A PRECEPT handed down from surgeon to surgeon is that if one of two coexistent operative conditions is toxic goiter (exophthalmic goiter or adenomatous goiter with hyperthyroidism), the goiter should always be given attention first. It seemed wise to consider the reasons for the initiation of such a precept and to try to determine the truth or falsity of it.

The relative importance of this matter can be realized by considering the frequency with which two such conditions do exist in the same person. At The Mayo Clinic, in 1927, 2.37 per cent of the patients with exophthalmic goiter and 7.3 per cent of those with toxic adenoma had complicating conditions which required operation.

There is no question but that, today, the picture of toxic goiter, in most sections of the country, is entirely different from that which was prevalent only a few years ago. The milder form has been brought about by education, prophylaxis with iodine, and surgical treatment at an early stage of the disease. Uncomplicated, the risk in those cases seen in former years brought premature gray hair to many a doctor's head. These patients needed little in the way of surgical shock to throw them into a state of postoperative toxemia, which resulted too frequently in death.

The clinical picture in such a case is represented by a sudden rapid rise in temperature and pulse, out of proportion to that which would be expected from the surgical procedure involved. Both remain relatively high. The pulse, as time goes on, due to added strain on the heart, becomes irregular. Maybe fibrillation enters the picture, and in quality the pulse becomes weak and thready. The patient sweats freely; respiration gradually becomes rapid and shallow; vomiting and delirium may develop, and, as the progress is uninterrupted, diarrhea, coma and death follow.

When two diseases coexist, one of which is concerned with the thyroid gland, and when care in the development of a complete history of the case is not taken, often the condition of the thyroid gland may be overlooked, due to the fact that the patient's only complaint obviously points to the other disease. It is not amiss therefore to repeat an axiom that at all times one must be looking out for masked symptoms.

This may be more clearly illustrated by citing the case of a patient who entered the clinic with a draining sinus in the region of the gallbladder, following cholecystotomy performed elsewhere seven months previously. Attention obviously centered about the causes of such a condition. A complicating exophthalmic goiter was not recognized until just prior to a planned exploration. Possible trouble was thus fortunately averted. An interesting fact which developed during convalescence from the primary operation for the goiter was the appearance of a sponge at the outlet of the draining sinus. This was removed. A few days later, cholecystotomy was done, at which time two stones were removed. One was the size of a walnut; the other a smaller stone, the size of a filbert, was impacted in the cystic duct. Following this the patient made an uneventful recovery.

Occasionally, after operation, a condition simulating a mild thyroid crisis develops, but preoperatively the complicating disease was unrecognized. Such a postoperative complication is mainly cardiac in nature, and it reacts favorably over a period of a few days to administration of compound solution of iodine (Lugol's solution). The possibility of such a cause for such a sequence of events must necessarily be kept in mind.

The following case may be taken as an example:

A married woman, aged forty-six years, came to the clinic August 17, 1926, complaining of "falling of the womb," which had gradually increased in severity in the last twenty-three years. She was the mother of eight children who were living and well, but her condition had become definitely worse following the birth of her last baby two years previously. The uterus and vaginal walls were so greatly prolapsed that they would have to be manually replaced after the patient walked across the floor. No other important features were brought out in the history.

---

*Read before the Southern Minnesota Medical Association, Mankato, Minnesota, August 25, 1930.

General examination centered around the pelvis, and the diagnosis was of relaxation of the anterior and posterior vaginal walls, and cystocele, rectocele, and prolapse of the cervix and uterus, all graded 3. The fundus and fornices were normal. The blood pressure at the time of examination was 115 systolic and 70 diastolic. The pulse rate was 80 beats a minute. The tonsils were infected, graded 3.

August 24, the patient was operated on for the pelvic condition. The procedure was uneventful but postoperative progress was stormy. On the day after operation, the temperature exceeded 105° F. and the pulse rate varied between 125 and 160.

A medical consultant reported that the thyroid gland was enlarged, firm and slightly irregular but that no adenomas were found. A bruit, graded 1, was heard at each upper pole. Fine tremor, graded 2, was present. The systolic blood pressure was 132 and the diastolic 78. The consultant thought the patient's condition was probably due to a hyperthyroid reaction. He recommended that compound solution of iodine be given daily in doses of 50 drops, either by mouth or by proctoclysis.

The pulse and the temperature remained elevated. August 27, the cardiac rate was rapid and extrasystoles were present. Bronchopneumonia of the base of the right lung was suspected, but two days later the râles disappeared. The next day, auricular fibrillation was present, but the patient was improving. The temperature was normal and the pulse rate ranged from 80 to 95 beats each minute. Administration of compound solution of iodine was continued, 10 drops three times a day, and the patient was kept at complete rest.

By September 6, the basal metabolic rate was +13 per cent, the pulse rate was 76, the systolic blood pressure was 90 and the diastolic pressure, 50. When, on September 18, the basal metabolic rate was —4 per cent, the pulse rate 67, and the blood pressure 80 systolic and 38 diastolic, administration of compound solution of iodine was stopped.

Two days later, the patient was dismissed from the hospital. By September 23, the symptoms of hyperthyroidism had been completely checked, and on the following day, with a basal metabolic rate of +21 per cent, the patient was allowed to go home, with directions to return to the clinic in two weeks. She returned October 14, at which time her basal metabolic rate was found to be +13 per cent. She was advised to go home, not to take any medicine, and to return later.

November 18, the patient returned as requested. Examination revealed recurrence of the hyperthyroid condition since she had stopped taking compound solution of iodine. She had tremor, graded 2, and a basal metabolic rate of +29 per cent. Subtotal thyroidectomy was performed November 26. The pathologic report was of diffuse small colloid and fetal adenomas in a colloid thyroid gland. Parenchymatous hypertrophy was not found. Clinically, however, the case was definitely one of exophthalmic goiter.

By the middle of December there had been gradual diminution of toxic symptoms. The patient was dismissed and advised to take compound solution of iodine, 10 drops daily for ten weeks. March 10, 1927, her basal metabolic rate was —5 per cent. Symptoms of hyperthyroidism had completely disappeared. Tonsillectomy was performed uneventfully at this time.

STUDY OF A SERIES OF CASES

In 1927 there were only four cases in which major operations preceded thyroidectomy by a few weeks to a few months, and of this number, two were cases of exophthalmic goiter and two of toxic adenoma.

In one of the cases of exophthalmic goiter and in one of the cases of toxic adenoma, the complicating goiter was recognized preoperatively, but thyroidectomy was advisedly deferred (the patient receiving compound solution of iodine meanwhile) until after more necessary operations had been done. In the other two cases the postoperative reaction brought to light the hyperthyroid condition and the condition of these patients, too, was satisfactorily controlled by compound solution of iodine, and subtotal thyroidecetomy was performed later.

As an example of the type of case in which the two conditions are evident and thyroidectomy must be given a secondary place, I would cite a case in which there was a brachial arterial embolus of forty-eight hours' duration, and in which hyperthyroidism also was evident. The patient was hospitalized, compound solution of iodine was given and efforts were bent toward reestablishing collateral circulation. When these efforts failed, the arm was amputated on the eighth day, and the patient's postoperative progress was uneventful; there was no sign of thyroid crisis. Later, subtotal thyroidectomy was performed, and the pathologic report confirmed the clinical diagnosis of parenchymatous hypertrophy.

Because of the small number of cases in this group, it is unwise to draw conclusions. However, in forty-five cases, thyroidectomy for adenomatous goiter with hyperthyroidism preceded another major operation and in thirty-six cases thyroidectomy for exophthalmic goiter preceded another major operation. It is fair to ask whether it might not have been safe to reverse the order of procedure in these cases.

In order to answer such a question intelligently it is necessary to review, from the standpoint of risk and advantages, the cases of toxic goiter, exophthalmic goiter and adenomatous goiter in which thyroidectomy had been done as the preliminary measure.

The mortality of thyroidectomy for exophthalmic goiter and toxic adenoma uncomplicated by another condition for which operation was required averaged 0.76 per cent in 1927. There were no deaths as direct results of thyroidectomy being done as a measure preliminary to other operations. Although deaths occurred, one from bronchopneumonia following a two-stage Mikulicz operation for carcinoma of the colon and one from rupture into the peritoneum of a corio-epithelioma, they were not attributable to the primary thyroidectomy. Consequently, it can be considered that in a fairly representative group of cases of toxic goiter, preliminary thyroidectomy has not increased the risk, but, on the contrary, from the complications which it is known are likely to arise when preliminary thyroidectomy has not been considered, it tends to eliminate the toxemia of hyperthyroidism and thus to diminish the risk of future major operations. Therefore there should be little doubt as to the true value of the procedure.

Interesting facts developed in the course of perusal of these cases. Eighty-eight per cent of the patients were females; this explains the fact that there was a high proportion of gynecologic operations in this series. The average duration of symptoms of exophthalmic goiter was two and a half years; the average duration of other complicating symptoms was two and eight-tenths years. Here it is well to call attention to the fact that, although the average figures would indicate close relationship between the onset and duration of these coexisting conditions, this is found not to be true when the individual case is studied This, then, is an example of the false conclusions concerning particular groups of cases which might be reached from coincidental figures.

In the cases of toxic adenoma the average duration of symptoms of goiter was fifteen and three-fourths years, and the average duration of complicating symptoms was six years.

CONCLUSIONS

1. Generally speaking, thyroidectomy should be performed preliminary to other major operations when a toxic goiter (exophthalmic or adenomatous goiter with hyperthyroidism) coexists with another condition in which surgical intervention is required.

2. Should an acute condition arise, in which the judgment of the surgeon indicates that advantage would be gained by deferment of thyroidectomy, the importance of giving preoperatively compound solution of iodine as a prophylactic measure against thyroid crisis must not be overlooked.

3. Of the patients in whom hyperthyroidism coexists with another condition for which operation is required, about 88 per cent are females.

4. There is no causal relationship between the toxic goiter and the complicating disease.

INTRA-ABDOMINAL ABSCESS

REPORT OF CASES

P. E. Stangl, M.D.
St. Cloud, Minnesota

FIFTEEN years ago I was confronted with a nine-year-old girl intensely ill. She had been sick for two weeks beginning with pain in the lower right abdomen and vomiting. She recovered, but toward the end of the second week pain developed in the lower abdomen with loss of strength. Examination revealed a septic child, with a temperature of 101, pulse of 120, respiration of 20, and moderate tenderness in lower left abdomen. The abdomen was flat and not rigid. The urine was normal; the leukocyte count 32,000 on two occasions. Light percussion of the abdomen revealed a mass in the lower left quadrant close to Poupart's ligament. Rectal examination revealed a tender bulging mass on the left. A diagnosis of intra-peritoneal abscess was made and the abscess opened and drained, with complete recovery in three weeks. She has been well since and is the mother of three children. The abscess wall was made up of omentum, small bowel and parietal peritoneum of the anterior abdominal wall. The absence of any great amount of literature on the subject and the fact that forty-two cases of like nature have been encountered, prompted me to correlate a few of the facts and make this report.

Perforated appendicitis with a circumscribed peritonitis about the appendix or accompanied by a diffuse peritonitis forms a basis for every case in this report.

Secondary intra-abdominal abscesses are classified as intra-peritoneal and extra-peritoneal. The intra-peritoneal type appears in three locations as one or more solitary abscesses which may be connected with each other. The protective barriers of the intra-peritoneal space are the omentum, bowel mesenteries and the parietal peritoneum and these wall off the suppurative exudate to form an abscess either in the right or left lower quadrant or in the pelvis about the bladder. The omentum in diffuse peritonitis helps to produce a localization of the peritonitis and this takes place usually about the portal of entry in the lower right quadrant. The abscess however may be walled off on the right side and may consist of more than one circumscribed abscess as described above. These encapsulations, if not drained, either fuse and perforate the protective wall in from six to ten days reproducing a generalized peritonitis, or terminate as a fibrous peritonitis with resolution. Perforation of the bowel has been reported.

The extra-peritoneal type are found secondary to a circumscribed abscess about the head of the cecum and are most commonly found behind the cecum. These, if not drained, may extend behind the ascending colon to form a perinephritic abscess, or may continue upward, resulting in a subphrenic abscess. A right empyema occasionally completes the picture.

The cases under consideration comprise one or a combination of two, three or four of the above described localized abscesses.

Clinically these cases present themselves as perforating appendicitis with a diffuse peritonitis or localized peritonitis in the right lower quadrant. The stage of progress is determined by the number of days after the original onset. The secondary process appears either before or after the appendix is removed with drainage. In the usual case, drainage is followed by an abatement of the abdominal symptoms and then the case starts to go wrong on the sixth or seventh day with the appearance of an afternoon temperature and pulse rise. With the appearance of these hectic symptoms secondary abscesses should be looked for. The leukocyte count will increase from 13,000 to 30,000 and should be taken twice daily for two or three days and if it remains persistently high or increases, a secondary abscess is the usual finding. When the secondary symptoms appear about seven days after the original drainage, the insidious onset is more likely to indicate intra-peritoneal involvement, whereas a sudden ushering in with chills and fever is more apt to be extra-peritoneal.

Considerable stress should be placed on the rising leukocyte count, taken twice daily, and whenever present is almost positive indication of an active secondary process. In looking for the localization, the piano percussion of Murphy brings out the areas of induration more readily than the usual palpation or heavy percussion. Diagnostic puncture is always admissible and is the more practical and safe procedure when used extra-peritoneally.

The only confusing differential issue may be a stitch abscess about the wound which appears about the fifth day. Careful examination with spreading of the wound will usually settle the question.

Once the diagnosis is made, free incision and drainage affords the best results. These drainage wounds should be large and left open, as the practice of partially suturing them is not good technic and often defeats the purpose of thorough drainage. Conservative handling of the abscess wall especially within the peritoneal cavity is imperative, as a diffuse peritonitis may be reproduced.

Fowler's position should be maintained at all times.

The reaction of intra-peritoneal pus is more pronounced when the abscess wall contains small bowel. Whenever the abscess wall is made up of omentum, parietal peritoneum and loops of the ascending or descending colon, the protection is as complete as nature can make it and if the surgical drainage is done with reasonable care a prompt recovery is certain.

Case 1.—A male, aged 63, was taken suddenly ill with chills and fever and moderate pain just above the right iliac crest posteriorly. Examination made two days after onset revealed a temperature of 102, pulse 100, respiration 20, a normal urine and a white blood count of 18,000. A slightly tender indurated mass was made out above the right iliac crest posteriorly. Diagnostic puncture revealed pus and under local anesthesia incision in the right flank and drainage of a large abscess was made. He returned in sixteen months with the same condition and the same treatment was instituted. Two years later he had another recurrence and another opening was made in the right flank through which a perforated appendix was removed. This was all done without going through the peritoneum. This represents the typical extra-peritoneal type.

Case 2.—A male, aged 17, complained of pain in the lower abdomen for two weeks. He stated that he had lifted a heavy barrel of ice and vomited for three days following the supposed injury. He remained in bed the first week but the second week was up and about. Three days before examination he complained of painful urination. Examination revealed a rigid tender abdomen with the greatest tenderness over the region of the sigmoid. Rectal examination revealed a resistant tender mass in the lower left pelvis. Fluoroscopic examination revealed the barium in the rectum, which shot into the descending colon through a three-inch thread-like stream and filled the colon above. As the rectal pouch filled he complained of pain. His temperature at this time was 99, pulse 96, white blood count 13,000; the urine contained many pus cells. Diagnosis: secondary intra-peritoneal abscess of left lower quadrant. The abscess was opened and drained but the response was not good and on the sixth day after drainage an induration of the lower right quadrant with rigidity of right rectus was found. This was opened, drained and the appendix removed. The patient recovered.

Case 3.—Operation was performed on a female, aged 18, for a perforated appendix with localized right-sided abscess. Progress was good for six days, when hectic symptoms appeared. A retro-cecal abscess was opened through the right flank. Progress was again good for four days when the fever reappeared. The retro-cecal opening was enlarged and a deeper pocket was found and drained. Ten days later chills and fever appeared and the patiently was intensely ill. Two days later a diagnostic needle revealed a subphrenic abscess and this was drained extra-pleurally. Two weeks later a right empyema was drained with resection of a rib in the posterior axillary line. She survived the ordeal, and is now in good health.

In conclusion, intra-abdominal abscess as outlined here is the secondary result of perforated appendicitis with generalized or circumscribed peritonitis. It should be suspected whenever evidence of infection manifests itself following abatement of the general abdominal condition. The leukocyte count is paramount in deciding the presence of pus in the body and should be repeated twice daily when in doubt. John B. Murphy originated the piano percussion in this work.

I hope that my classification of intra- and extra-peritoneal abscess will assist in correlating a definite entity under the complications of perforated appendicitis.

CASE REPORTS

ALCOHOLIC POLYNEURITIS WITH CRANIAL NERVE INVOLVEMENT: KORSAKOW SYNDROME*

REPORT OF CASE

Gordon R. Kamman, M.D., F.A.C.P.
Saint Paul

According to Bruch,[1] reports of cranial nerve involvement are relatively rare in the literature of alcoholic polyneuritis. In them paralysis of the vagi and of the phrenic nerves is usually given as the cause of death. Other cranial nerves subject to degenerative processes in chronic alcoholism are the vestibular, acoustic, oculomotor, and optic. The involvement may be either central (nuclear degeneration) or peripheral (demyelinization, vacuolization, and granular degeneration of the nerve fibers). Because of the frequency with which mental changes accompany peripheral alcoholic neuritis, and also of the concomitant degenerative processes in the spinal cord, Campbell[2] said, as long ago as 1894, "Alcoholic polyneuritis can no longer be looked upon as restricted to an affection of the peripheral nerves." Along with cranial nerve involvement of peripheral or nuclear type, one may encounter the complex of an acute polioencephalitis.[3] I[4] reported such a case. It has been noted that patients with alcoholic ophthalmoplegia are particularly prone to the development of mental disturbances, especially of the Korsakow type. This report is that of a case in point.

L. E., male, single, aged 37, was admitted to the neurological service at the Ancker Hospital complaining of pain in the chest, blurred vision, difficulty in walking, and marked indecision. He was very confused, thought that he had just been discharged from the Army, and did not know just why he was in the hospital or who had sent him there. The family history was negative except for the fact that the father had committed suicide. The past history was negative except for a previous admission to the hospital for chronic alcoholism and delirium tremens.

The physical examination was grossly negative and all noteworthy findings were confined to the nervous system. The left pupil was slightly larger than the right and both reacted sluggishly to light and in accommodation. There was moderate congestion of both optic discs but the fundi were otherwise negative. Concerning the extraocular movements, convergence and movements upward and downward were normal. However, there was paralysis of lateral conjugate deviation to both right and left. In other words, the eyes seemed to be fixed in the mid-line as far as lateral movements were concerned, but that there was no paralysis of the internal recti is shown by the fact that convergence was normal. This indicates a nuclear or a supra-nuclear lesion. There also was a slight involvement of the left abducens nerve (inward rotation of left eye) and nystagmus was present vertically. There was a spontaneous rotary nystagmus present upon a few occasions.

The upper extremities as well as the abdominal and cremasteric reflexes were normal. The lower extremities showed absent knee and ankle jerks with diffuse impairment of touch and pain senses distally. There was no atrophy, no fibrillary twitchings, and no pathological reflexes were elicited. The knee-heel test showed bilateral ataxia, the patient walked with a wide base and had a positive Romberg.

The mental examination showed that the patient was completely disoriented. He thought that it was 1919, and that he just had been discharged from the army. There was marked flight of ideas with overproductivity and increased psychomotor activity. The patient was hallucinated, frequently interrupted the examiner with questions directed at imaginary people, and was very distractible. The prevailing mood seemed to be one of euphoria and there was definite clouding of the sensorium. Many of his remarks were totally irrelevant to the situation then present, *i.e.:* "Well, boys, let's knock those spots off the ceiling." "Break off a piece of candy, won't you?" "We will have to get off pretty soon, some of the boys only have a dollar left." "You saw that lady that just passed—she is a peach."

Because of the unequal and sluggish pupils, the absent knee and ankle jerks, the gait, the Romberg, and the mental condition, the admitting officer made a tentative diagnosis of tabo-paresis. However, blood and spinal fluid examinations were negative and on the following day when I first saw him, the patient admitted having drunk about a pint of moonshine daily for the preceding two months. Because of the negative serum findings and the alcoholic history we felt that the patient was suffering from an alcoholic psychosis with polyneuritis involving some of the cranial nerves as well as those of the lower extremities. During the first two or three days in the hospital he was fairly quiet, the nystagmus began to subside, and within a week all of the extraocular movements had returned to normal except for an occasional vertical nystagmus. There also was some return of the knee jerks, but the ankle jerks remained absent.

On the third day after admission, and in spite of the improvement in his organic signs, the patient became worse mentally. He began to get noisy at night, thought that there was a case of beer under his bed, and was very restless. At first this was present only at night, but about fourteen days after admission the patient began to act peculiarly also during the day, showing the characteristic signs of a Korsakow psychosis. When asked where he had been the previous day he would recite a detailed account of various fancied experiences. One morning he said that he had been down town the day before, bought a shirt for seventy-five cents and put it on while standing on top of a sewer pipe that evening. Once when a nurse was shampooing another patient's hair, he said, "I washed that guy's hair three times yesterday." Again, he said that he had been to a picture show and that everybody in the place had been killed. He then asked if most of the people taken out of the morgue really were dead. On another occasion a nurse asked him where his drinking cup was, and he said that he had left it in his other cell, that he had two rooms in the hospital and that he alternated, sleeping in each one every other night. The mental condition grew progressively worse, the patient became increasingly noisy during the day, would void in his drinking cup and say it tasted like tea, became irritable and destructive, and finally, on August 23, one month after admission, was transferred to the state hospital for the insane with a diagnosis of Korsakow's syndrome (Korsakow psychosis with polyneuritis).

---

*Presented before the Ramsey County Medical Society, St. Paul, November 24, 1930.

On October 31st I received a communication from Dr. George H. Freeman, superintendent of the hospital, stating that all of the patient's cranial nerves were normal except for a slight vertical and lateral nystagmus. He walked with a broad base, had a positive Romberg, and the ankle jerks still were absent. Mentally, the patient was less confused, his memory had improved considerably, he was correctly oriented for place and person, but was somewhat confused as to dates. He no longer confabulated.

The above case is similar to others of its kind reported in the literature but is submitted for its clinical interest and comparative rarity.

REFERENCES

1. Bruch, Ernest: Zur Kasuistik der Polyneuritis Alcoholia. Deutsch. Archiv. f. Klin. Med., 116:612, 1914.
2. Campbell, Alfred W.: A Contribution to the morbid anatomy of so-called polyneuritis alcoholia. Quart. Jour. Inebr., 16:299 (October), 1894.
3. Coriat, I.: Alcoholic Neuritis. Quart. Jour. Inebr., 29:56, 1907.
4. Kamman, Gordon R.: Alcohol and its effects on the nervous system. Minn. Med., 10:153 (March), 1927.

1125 Lowry Medical Arts Building.

HEMOCHROMATOSIS OR BRONZED DIABETES*

REPORT OF CASE

H. A. Miller, B.S., M.D., and J. J. Heimark, M.A., M.D.
Fairmont, Minnesota

A male patient, J. E., forty-eight years old, came to the office January 18, 1930, complaining of weakness in the legs, weight loss, and dryness of the mouth. The patient was born near Fairmont, Minnesota. He was the proprietor of a grocery store, had been married sixteen years, and had no children.

The patient's parents were born in Scotland and came to America a married couple when about twenty-five years of age. The mother is still living and about eighty years old. She had enjoyed good health. Her skin is fair. The father was a carpenter and engineer by trade and was a robust well man until the last four years of his life, when he had repeated attacks of severe asthma, which caused his death at the age of sixty-four. His skin was rather dark. The couple had six children, all born alive, one girl and five boys.

The first child, the only girl, was born in Scotland. She was in good health until about fifty years of age, when she died following an operation for exophthalmic goiter. Her face and arms were darker in color in comparison with other girls in the neighborhood.

Two brothers died when small and the patient did not remember them, nor did he learn the causes of their deaths.

One brother, forty-six years old, appears darkly bronzed, in fact even more so than the patient herein reported. In casual conversation with this brother he states he has stomach trouble that has been diagnosed "liver disease."

The youngest brother is thirty-seven years old, and in good health. He has the fairest skin of them all.

The patient knew nothing about his grandparents on either side.

The patient had suffered no accidental injuries, nor had he undergone any surgical operations. As a youngster he had had mumps, chickenpox and whooping cough, and at the age of thirty-eight a mild attack of inflammatory rheumatism. In February, 1929, he had a serious attack of pneumonia. He denied venereal disease. There was no history of occupational poisoning. He, as well as his wife and friends, maintained that his previous habits had been good. He had never used alcoholic beverages to any extent in earlier life and certainly not in later life. He likewise at the first time we saw him was not using any patent medicine, drops, nor prescribed medicine. At that time he smoked about a package of cigarettes a day.

The present complaint, as previously stated, was weakness in the legs, weight loss and dryness in the mouth. It is an interesting fact that the patient would not have come for an examination even at this time had there not been pressure brought to bear on him not only by his wife but also by a business associate.

The patient was apparently in his usual good health until in February, 1929, when he was very low with an attack of pneumonia. He recovered and gradually regained his strength and former weight of 167 pounds and by late spring and early summer of 1929 was feeling as well as usual and returned to his store work.

Around the latter part of August and the first part of September, 1929, he began to observe he did not have the usual physical strength and endurance of former years, while his legs would grow especially tired by evening. In the morning he felt well rested and refreshed. By the first part of October, realizing he was not improving, he concluded that his physical weakness was possibly caused by absorption of poisonous material from extensively involved dental pyorrhea. In four different sittings he had fifteen teeth extracted. No complications followed and in due season he felt a little stronger, while his endurance was better the remainder of the fall and early winter of 1929.

---

*Presented by Dr. J. J. Heimark, at the annual meeting of the Southern Minnesota Medical Association at Mankato, Minnesota, August 25, 1930.

At the beginning of 1930, he weighed 140 pounds and was feeling fairly strong. But from this time until January 18, when we first saw him, he had lost in weight and was down to 122 pounds. During this same space of time he first noticed he was craving more fluids than normally and drank considerable milk and water throughout the daytime, but never at night, though he voided once to three times at night. There was no history of polyphagia. The bowels were regular once a day without the aid of laxatives and there was no diarrhea nor suspicious discharge from the bowels. He had no history of jaundice nor cardiac trouble. He had had no edema of the legs, no cough nor chest trouble. The weakness in the legs was not associated with any symptoms of anesthesia nor paresthesia. The legs became tired and weak when he was behind the counter waiting on customers. No other symptoms concerning the mouth and tongue were elicited outside of the complaint that they were dry. His wife had observed that from September, 1929, the patient's skin had become definitely and gradually a darker brown than at any previous time. He denied having any pain.

In the physical examination the most striking and evident thing immediately observed was the marked bronzing of the face, neck and hands in contrast to the rest of the body, which showed only moderate discoloration. The sclera showed no jaundice beyond a yellowish haze. A definite acetone odor was noticeable to his breath. All his teeth were out. The tongue was beefy red and dry, in fact his mouth was so dry his articulation was impaired. The tonsils were small and free. No discoloration was seen on the mucous membranes in the mouth. No sentinel nor suspicious glands were palpable anywhere. The face, arms and legs showed emaciation two, on a basis of four, with a flabby dry skin and considerable loss of subcutaneous fat with atony of the muscles. There was no enlargement of the thyroid. The heart was not enlarged, while the sounds were apparently of normal quality and no murmurs were heard. The lungs revealed no adventitious sounds. The abdomen was definitely enlarged, with the entire lower liver margin extending diagonally into the abdominal cavity, the margin reaching the navel. (The patient had not observed that his liver was enlarged.) The spleen was not palpable. Apparently there was no free abdominal fluid, and palpation of the rest of the abdomen showed nothing abnormal. There was no hernia, varicocele nor edema of the scrotum and legs.

Rectal examination revealed nothing of significance. Neurologically, no pathological reflexes were elicited nor abnormal cutaneous sensations detected. The blood pressure was 150/86. Temperature 97. Pulse 70. The urinalysis showed: sp. gr. 1.033, acid reaction, amber color, no sediment, no albumin, while Haines' solution was reduced with one drop of urine. Microscopically numerous white blood cells were present and only an occasional red blood cell; likewise numerous hyaline casts. The leukocyte count was 4,800, while the hemoglobin was 95 per cent (Dare). The blood sugar was 270 milligrams. *X*-ray of the stomach was negative. Fearing esophageal varices because of the enlarged liver, we refrained from passing a stomach tube to determine the gastric function. The blood and spinal fluid Wassermann was negative. The next day, January 19, Dr. Miller removed a piece of skin from the left side of the neck and this was forwarded to the pathology department of the Mayo Clinic, for examination for the presence of hemosiderin or iron pigment, as we suspected we were dealing with a patient ill with hemochromatosis or bronzed diabetes. February 1, 1930, we received the report on the skin sent to them, confirming our suspicion.

Since the introduction of insulin in the treatment of diabetes mellitus, it has been found that bronzed diabetes or hemochromatosis is one of several other diseases or pathological conditions that shows resistance to insulin. Root reports a case of bronzed diabetes of approximately one year's duration. This case required gradually increased doses of insulin throughout the year. However, he died in coma in spite of the administration of 1,680 units of insulin in twenty-four hours. Whether or not bronzed diabetic patients prove to be insulin-resistant in every case, I do not know.

This patient showed apparently no resistance to insulin, and did very nicely on a diet of approximately 85 carbohydrates, 65 protein, 160 fats and 30 units of insulin a day. He, however, gradually developed edema of the legs and finally abdominal ascites, that could be relieved only from time to time by abdominal paracentesis. He was tapped the first time May 3, 1930. He continued a downward course in spite of supportive medical treatment and expired June 24, 1930, with the picture of acute gastric hemorrhage, caused apparently by the rupture of gastric esophageal varices. The skin, especially during the last two months of life, became more and more pigmented until he was almost black at the time of his death. The sclera maintained about the same yellowish tinge as seen at the first examination.

The liver, spleen, kidney and specimens of lymphoid tissues were forwarded to the pathology departments of the University of Minnesota and the Mayo Clinic.

McCartney of the pathology department of the University sent us the following report:

> "The sections of the tissues sent show very characteristic appearances of hemochromatosis. The liver and lymph node show extremely large amounts of iron-containing pigment. The liver also shows cirrhosis. The spleen and kidney show pigmentation with an iron-staining pigment, but, in comparison with the liver and lymph nodes, only a small amount."

Habein, of the Mayo Clinic, forwarded the report on the tissues we sent him and the report shows:

> "Liver—marked cirrhosis with extensive iron pigmentation of the hepatic parenchyma and connective tissues."
>
> "Spleen—extensive fibrosis and iron pigmentation of capsule and to some extent of the connective tissue elements."
>
> "Lymph node—extensive iron pigmentation of the reticulum."
>
> "Kidney—iron pigmentation, slight, confined mostly to convoluted tubules."

> "The diagnosis of hemochromatosis with severe cirrhosis of the liver is confirmed. (Dr. Robertson has seen the slides and agrees.)"
>
> Signed: Dr. D. C. Beaver.

Added to the pathological reports of the tissues here given, should have been included the picture of the pancreas. But being allowed, only after several days pleading with the family, what I should call a "grab bag" post-mortem examination, the pancreatic gland was missed. What we thought was a piece of the pancreas proved to be under microscopic examination a lymph node. A pathological report on the pancreas would have been most interesting. A comparative study of the changes in the pancreas with those of the liver and other tissues might possibly have explained why this patient was a mild diabetic as well as non-resistant to insulin. Clinically this patient was outstanding as a cirrhosis of the liver and passed out of the picture as such. Was it possible that the liver and lymphatic systems, which showed the heavier deposits of iron pigment as compared to the kidney and spleen, were carrying the burden of the pathology and that the pancreas was even at the time of the patient's death only slightly affected?

Root in his article refers to Sheldon's findings in one case of hemochromatosis in which the picture was hepatic insufficiency with abdominal ascites without glycosuria and the pancreas showed only .55 per cent concentration of iron. Sheldon also found that in all his cases diabetes was present where the iron concentration exceeded 1.5 per cent.

Textbooks devote only a few passing remarks to hemochromatosis or bronzed diabetes, give a bad prognosis and then dismiss the subject by stating the condition is a very rare disease. In bringing up the subject with Professor Berglund, Chief of the Department of Medicine at the University of Minnesota, this winter, I became deeply impressed with his review of the subject. Berglund stated, among other views, that Joslin accepted the diagnosis of bronzed diabetes only when the patient showed resistance to insulin. Berglund, however, was not ready yet to accept this view.

Is hemochromatosis a constitutional disease manifesting itself late in life with faulty iron elimination? Is there then, from infancy, a continual, gradual retention of iron pigment that insidiously works its havoc and after forty years or more of destructive work finally presents itself in full-blown regalia as evidenced by bronzing of the skin, enlargement of the liver, glycosuria, weight loss and muscular weakness? The significance, if any, of the discoloration in the patient's father and sister, is only conjectural. However, the patient's forty-six year old brother is certainly very dark brown or bronzed. In fact, he is more pigmented than the patient was the first time we examined him. We saw this man possibly six or eight times from the last part of January until his brother died, June 24, and we could not help but comment on the striking similarity of the skin pigmentation of the two. The added interesting thing, too, is that he has been diagnosed "liver trouble," —broad as this term may be. That the brother has the same condition is probable and possible, and leads us to suspect that the etiology can be constitutional.

LARGE BENIGN MOLE OF THE SCALP

REPORT OF CASE

E. W. Humphrey, M.D.
Moorhead, Minnesota

The patient, a laborer, fifty-one years of age, was admitted to Moorhead Clinic September 20, 1930. According to his family history his mother and five brothers were alive and well, while his father had died from an attack of pneumonia and his sister had died during confinement.

The patient had had no illnesses except scarlet fever and rheumatism when he was fifteen. While still a small boy he noticed a swelling or lump over the occipital region of the head, which continued to grow until it practically covered the occipital region with a base about half the size of the tumor. This mass resembled a large cauliflower in appearance, having many crevices and fissures upon its surface. Upon squeezing the tumor a thick cheesy exudate could be pressed from the part squeezed.

General examination failed to show, aside from some dental caries, any further abnormality. Laboratory examination showed the urine normal and the blood Wassermann was negative.

Under general anesthesia and the application of a tourniquet, the patient was operated upon September 21, 1930. The large mass was dissected off down to the periosteum of the bone. Large vessels were ligated and two weeks later skin was taken from the thigh and grafted over the entire surface.

The dissected tumor was sent to Dr. E. T. Bell's laboratory, where it was diagnosed as a benign mole of unusual size, containing a large amount of fibrous tissue. It extended down below the level of the incision.

According to the pathologist's report further operation was not advisable, since some of these moles extend deeply into the tissue. The report also stated that this type of mole sometimes recurs after removal, which, of course, greatly alarms the patient, but that recurrence of a benign mole is not malignant.

A differential diagnosis of growths of the scalp is at times very complicated, since the condition may be due to a variety of ways in which it originates. Some of these growths give way to malignant degeneration, while others remain benign. Benign moles of the scalp must be distinguished from elephantiasis of the scalp, which is a chronic and sporadic disease of the skin and subcutaneous tissues. It is characterized by enlargement, deformity, lymphangitis, swelling, thickening, and more or less papillary growth.

Verruca digita is a formation of growth commonly observed on the scalp where clefts or digitations are sometimes found extending nearly down to the base. When the digitations do not extend completely to the base, the lower part or neck is sometimes relatively much smaller and the growth has then a pedunculated appearance, the upper cleft part tending to spread out somewhat.

Wens or sebaceous cysts of the scalp have little or no hairy covering. Ricker and Schwalbe in a monograph on tumors of the skin reviewed the literature up to 1914 and found that forty-three cases of malignant degeneration in sebaceous cysts had been reported. Of this number, the scalp was affected in but seven patients. Of 236 cases of sebaceous cysts excised at the Mayo Clinic only twelve were associated with malignancy and the scalp was involved only four times.

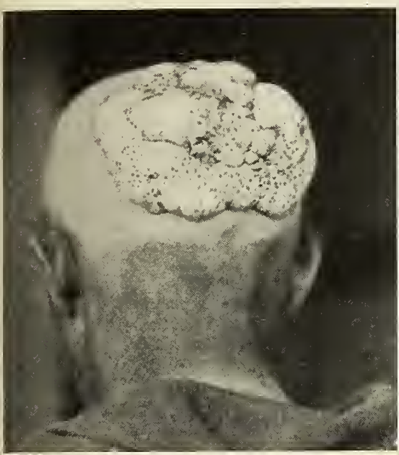


Fig. 1. Appearance before operation.

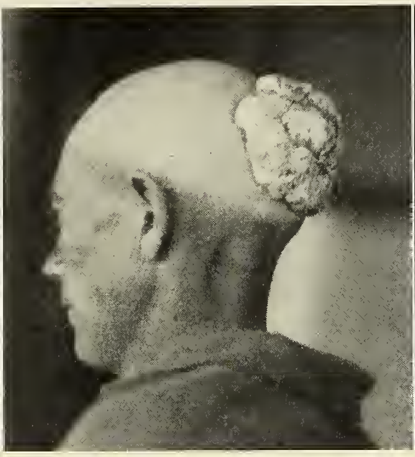


Fig. 2. Profile view before operation.

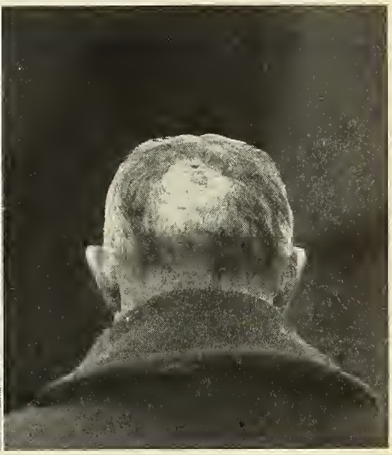


Fig. 3. Appearance six weeks following operation. Wound completely healed.

Cylindromatous tumors occur on the scalp, principally in women, as a lobulated growth covered with thin reddish blue skin, not spontaneously ulcerating and of long duration.

Nevus vasculosus is both flat and elevated from the angiomata proper, the former being histologically primary angiectases without any capillary budding. They are sometimes congenital and sometimes acquired.

According to Tieche of Berne, Switzerland, the two main charactertistics of nevi are the existence of the trouble from early life and the matter of their being benign.

A search through the literature in the Surgeon General's Library in Washington, D. C., has not revealed a case similar to the one here reported.

THERAPEUTIC POTENTIALITIES OF "MUSTARD GAS"

From time to time hopes are still entertained for some possible usefulness in medicine of "mustard gas," chemically known as dichlorethylsulphide. British and German investigators report that the dermal application of dichlorethylsulphide will prevent the development of the experimental cancer of tars. Forster of the Pharmacologic Institute at Würzberg has reported that dichlorethylsulphide in high dilution was the most efficient hair growth promoter of a considerable number of agents tried. Quantitative estimations of hair growth on shaved cats, treated locally with concentrations of 0.01 per cent of the compound in fifty per cent alcohol containing 2 per cent of glycerin, showed a much greater production of hair than with other substances used. Impure yellow petrolatum, but not the pure white product, was next in efficiency to dichlorethylsulphide, this being attributed to impurities acting as irritants. Forster found that when agents are used that cause excoriation a diminution or inhibition of hair growth occurs, and he suggests that this may also occur after injudicious application of dichlorethylsulphide. Lest the results of this research on hair tonics in felines arouse premature hopes in the bald and near-bald, it should be mentioned that not all shaved and bald skins responded equally well. Nor are all "war gases" necessarily effective, for the German cats, in Forster's hands, frankly declined to respond to the much vaunted "war gas" of the Allies. (Jour. A. M. A., January 3, 1931, p. 41.)

PRESIDENT'S LETTER

ANOTHER secretary's conference is over, with its crowded program and its multiplicity of problems pushing for attention in one short day's session.

It was particularly impressed upon me at this 1931 meeting that the great task of preaching public obligations to the doctors is all but done.

When such obligations are seriously discussed, not as fancy flights to be indulged in at meeting times only, but as the sober essentials of the business of the smallest county medical society, the fight is as good as won.

It is vastly significant for the future of medicine that societies of only fourteen members and less should be acting systematically and collectively to take an important part in the public health education and direction in their communities. Hitherto they have left such things for the most part to the state office or to the highly organized large city societies.

That this is the new pre-occupation of the smallest units of organized medicine was clearly in evidence at the meeting. To foster it is the most important single thing any man or group of men can do for legitimate medical practice and the public good.

Two practical and important contributions to the effective conduct of the doctors' collective business were submitted by the conference visitors from Wisconsin and Iowa. Without doubt the employment of full time executive secretaries for county medical societies of centers even smaller than Milwaukee is the next step in county medical society organization. I found Mr. Wiprud's account of the year's business, under his management in the Milwaukee County Medical Society, significant and valuable. Many of our Minnesota societies are headed in the Milwaukee direction. Equally important to the other people of the medical organization was the account of the enterprising and active little Polk County Medical Society, outlined by Mr. George Larson of Frederic, Wisconsin.

In Iowa the care of indigent institutional sick by contract with the county medical society concerned is a well oiled, well organized system. It has been working there for years. Vernon D. Blank of Des Moines, managing director of the Iowa State Medical society, and enthusiastic sponsor of the scheme, told Minnesota conferees he thought it would do equally well in Minnesota. The contract plan is an interesting and attractive possible solution to the problems of many of our Minnesota societies.

The degree of coöperation and interdependence between the State Medical Association and the public health agencies dispensing many thousands of dollars of volunteer funds in Minnesota, as reflected in the afternoon's symposium, was a surprise to nearly everybody. This practical working alliance between two frequently antagonistic agencies has grown up so quietly that even those of us who have been directly concerned have not appreciated its full extent and importance.

Our secretary, E. A. Meyerding, read a paper outlining its history and workings very fully before the secretaries' conference of the American Medical Association in Chicago this year. The subsequent expressions of astonishment and interest indicate the uniqueness of the arrangement.

I cannot do better in this letter than to urge every member of the association to read Dr. Meyerding's paper in the January number of the *American Medical Association Bulletin.* He is sure to share my pride in our association.

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE
A. S. HAMILTON, M.D. .... Minneapolis
D. C. BALFOUR, M.D. .... Rochester
J. T. CHRISTISON, M.D. .... St. Paul
E. L. GARDNER, M.D. .... Minneapolis
JOHN M. ARMSTRONG, M.D. .... St. Paul
R. E. FARR, M.D. .... Minneapolis

CARL B. DRAKE, M.D., St. Paul .... Editor
Lewis M. Daniel, M.D., Minneapolis .... Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna .... First District
F. M. Manson, M.D., Worthington .... Second District
Geo. B. Weiser, M.D., New Ulm .... Third District
H. B. Aitkens, M.D., LeSueur Center .... Fourth District
F. U. Davis, M.D., Faribault .... Fifth District
E. L. Gardner, M.D., Minneapolis .... Sixth District
Paul Kenyon, M.D., Wadena .... Seventh District
O. E. Locken, M.D., Crookston .... Eighth District
E. L. Tuohy, M.D., Duluth .... Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV March, 1931 No. 3

THE PSYCHOPATHIC HOSPITAL

The need of more adequate facilities for teaching psychiatry at the Medical School of the State University has been realized for some time by those who are acquainted with the situation. In the past about the only knowledge a medical student gained concerning mental diseases was obtained from a few theoretical lectures, a little reading and the occasional glimpse of a mental patient at one of the General Hospitals. On graduation he probably knew the definition of an hallucination, or an illusion, but of practical diagnosis and knowledge, almost nothing. The fault has not been with the teaching staff. They have done their best with time allotted and the facilities and material at their disposal. It has been due to the lack of a Psychopathic Hospital on the Medical Campus.

The importance of bedside teaching is readily recognized and admitted in surgery and medicine. It is no less important in psychiatry. Realizing this defect, a plan was evolved, and tried during the past two years, of having the classes spend three weeks at the State Asylums. This was not successful, on account of lack of teaching organization at the hospitals and the short space of time.

Aside from teaching, the purpose of the hospital would be to act as a receiving hospital for many patients from the country districts, who are now sent direct to the State Asylums. Many of these patients are there only a short time before recovering and would not have been committed had the facilities of observation and a short period of treatment been available. Such cases would be saved the stigma of a commitment. It would also assist the Probate Courts and physicians of the country districts in solving many difficult problems relative to commitment. In this way it would also act as a clearing hospital from the country districts to the State Asylums.

One of the objections to such a hospital is the cost. At present in the State of Minnesota there are approximately as many beds for mental cases as there are for all other hospital cases combined. Some of the hospitals have a waiting list and they all are reported crowded. The cost of such a hospital, whose main function would be to disseminate knowledge about diseases which have created such appalling conditions, is well worth while when the problem is viewed as a whole.

Another objection suggested is that it would be another step toward state medicine. It wouldn't even be a stagger in that direction when these 60 to 100 beds are considered in view of the fact that well over 5,000 mental beds are now maintained by the State.

Another objection suggested is that private institutions now treating such cases will be adversely affected. It is understood that the hospital will be conducted along the general lines now in force at the University Hospital. It will be a charity institution, but it is estimated that about 10 per cent admitted will be able to pay a part of their hospital expense. This situation now exists at the University Hospital. No private beds are contemplated. The experience at Colorado, where such a hospital is giving invaluable service, has been that worthy private institutions have been benefited by wider patronage by the public.

The situation will not be remedied until such a hospital is erected. It is earnestly hoped that the State Legislature will become cognizant of the problem and will heed the plea of the University for such a hospital on the Medical Campus.

George N. Ruhberg, M.D.

WORK AND HAPPINESS

The capitalist assisted by the economist wanders at times from his own domain into the field of medical economics. We plead guilty to the offense of getting out of our own field in making the following observations.

Hamilton Fish recently presented a report of his investigation of communism in the United States. According to the report, there is an active organization in this Country working under the direction of Russian communistic leaders whose purpose it is to undermine our American economic system. This is doubtless of serious import. It is, however, of additional interest to hear that in the same report Mr. Fish asserts that Capitalism is on trial in this Country.

There is some reason to believe that we, as a nation, are money-mad—that money is our standard of value. A millionaire dies and leaves all his wealth to his few immediate heirs, ignoring all of the many social activities devoted to the betterment of his fellowmen. Of course, he may have donated liberally to various activities of this sort during his lifetime, and that is admittedly the more worthy way of giving. But does such an exhibition *post mortem* tend to counteract the spread of communistic ideas?

Have capitalism and big business fully appreciated their responsibilities? No! and never will entirely.

The attitude of big business towards the employee varies in the extreme. One large concern we have in mind has developed an enviable reputation with the public and a devotion on the part of its employees. And why? Because somewhere at or near the top there is a someone who treats the employees as human beings and not simply as cogs in a soulless machine. Each employee is guaranteed a minimum hourly wage and a certain number of hours' work a week so that he knows what he can count on. Provision is made for an old age pension and employees are not discharged just before the pension age is reached.

Another large company we know something about is the exact antithesis of the above. Factories are closed unless they can be run at full capacity—it pays more. This results in periods of unemployment each year and the much vaunted high minimal daily wage amounts in a year's time to very poor pay. From the bottom up, employees are dismissed without consideration for length or quality of service rendered. Is there any wonder that there is little real esprit de corps in the organization?

Happiness is what we all are striving for. One achieves it in one way—one in another. On the whole (although there are those who would argue otherwise) work is one of the essentials for human happiness—work that is congenial and that brings the desired results. No one can be happy who fears the loss any moment of his livelihood. The anxiety incident to such a situation seems at times worse than actual unemployment itself. When an employee sees a total lack of consideration on the part of the employer for his employees as human beings, he is likely to despise his employer and hate his work. To him the whole world is wrong. Such a situation will often bring the employee to the verge of a nervous and mental collapse, as physicians have occasion to know.

So much for business methods in use in our Country in the twentieth century. Some argue that periods of more or less unemployment are necessary. Admittedly, some individuals are too lazy and useless ever to be entitled to a job. But such an extreme degree of unemployment as we are now experiencing should be preventable. The suffering entailed is much worse than that resulting from the so-called high cost of medical care. Whether the solution of the problem of preventing periods of financial depression lies in a revision of sales methods to prevent overproduction or abolishing the gold standard (a varying medium of exchange) and substituting a nonfluctuating governmental currency—here is a field for the energy of the business man and economist where there is a challenge.

HISTORY COMMITTEE

Will not some of you who read this "Historical Stuff" help to stimulate the gathering of material for our History of Medicine in Minnesota? Contribute something so we shall not have to think up new things from month to month to put in here. Our own knowledge of early medical men and events is largely confined to our own city and you may become tired of it. We long thought the first published medical communication came from a Minnesota physician in 1853, and Dr. J. H. Murphy contributed a note on abscess of the breast in 1854. A few months ago, however, we found an article written in 1815 and published in 1818 by the first medical officer at Fort Snelling, and a still shorter time ago we unexpectedly picked up Vol. I, No. 4 (January, 1859) of the *Minnesota Homeopath*, published in St. Paul. We had always thought Dr. A. J. Stevens' *Northwestern Medical and Surgical Journal* (1870-1874) the first in Minnesota. After looking over the *Homeopath*, however, we concluded it hardly merits the name of a journal, but nevertheless it gave us an historical, not hysterical, thrill. Write Dr. H. M. Workman, Tracy, Minnesota, if you know where any copies of the *Albert Lea Medical Journal* may be had. We would appreciate it.

J. M A.

OF GENERAL INTEREST

Dr. Sam E. Sweitzer and Dr. Henry E. Michelson were recently elected corresponding members of the Vienna Dermatological Society.

Dr. Stanley Chunn has disposed of his practice at Lake Wilson and is now located in Minneapolis, where he is taking a three-year fellowship at the University Hospital in the Department of Ophthalmology and Otolaryngology.

The Administration Committee of the University Medical School recently voted to use the terms Clinical Professor and Clinical Instructors in applying to faculty members giving voluntary part time service to the university. The distinction seems advisable.

Ground was broken Monday, February 16, for a new $200,000 nurses' home for Charles T. Miller Hospital, St. Paul.

The structure, which will be completed next fall, will be five stories, constructed of brick and reinforced concrete and fireproofed throughout. It will include dormitory facilities for 133 nurses and the hospital's nurses' training school.

Dr. Clay Ray Murray, Associate Professor of Surgery at Columbia University, New York City, visited Minneapolis at the invitation of the Minneapolis Surgical Society. Dr. Murray spoke on "General Treatment of Fractures" at the Hennepin County Medical Society Auditorium, February 4, and conducted a clinic on fractures at the Minneapolis General Hospital the day following. At the annual meeting and banquet of the Minneapolis Surgical Society held at the Nicollet Hotel, February 5, the society was addressed by Dr. Murray on "Delay and Non-union of Fractures."

Word has been received of the death of Dr. Charles Bryant Witherle, who practiced in St. Paul for a number of years. Dr. Witherle died at his home in Portland, Maine, February 3, 1931. He was born in Castine, Maine, on January 15, 1855, and received his medical education at Harvard Medical School, where he was graduated with the degree of M.D. in 1881.

Dr. Witherle moved to St. Paul the following year and practiced there for fifteen years. He was at one time associated with Dr. William Davis and afterwards with Dr. Alex J. Stone. He was for several years editor of the *Northwestern Lancet* and was at one time secretary of the Minnesota State Medical Association. After leaving St. Paul, Dr. Witherle went to Portland, Maine, where he occupied the chair of Professor of Nervous and Mental Diseases for several years, in the Medical Department of Bowdoin College.

The formal opening of the new quarters and library rooms of the Ramsey County Medical Society was held on Friday evening, February 27. Dr. O. W. Holcomb, president of the Society, made the opening address. Dr. John M. Armstrong spoke on the founding of the Society, and Dr. H. Longstreet Taylor gave a short history of the County Medical Society. An historical address was tendered by Dr. Alfred Brown, Associate Professor of Surgery at the University of Nebraska School of Medicine.

On Saturday morning, February 28, the occasion was also celebrated by clinics and demonstrations held at St. Joseph's Hospital by Dr. William Boyd, Professor of Pathology at the University of Manitoba, Winnipeg, Manitoba; Dr. Sumner L. Koch, Associate Professor of Surgery at the Northwestern University Medical School, Chicago; and Dr. Fred M. Smith, Professor of Medicine at the University of Iowa, Iowa City, Iowa.

A reception for members and ladies was held Saturday afternoon at the new rooms. Besides President and Mrs. Holcomb, there were included in the receiving line, Mrs. George Bell, daughter of Dr. John J. Dewey, a pioneer St. Paul physician; Mrs. Everton J. Abbott, daughter of Dr. John Steele, a founder of the Society; Mrs. Charles Eastwick Smith, Sr., wife of Dr. C. E. Smith, a founder of the Society; Mrs. John W. Willis, daughter of Dr. Alfred Wharton, a founder of the Society; Mrs. John F. Fulton and Mrs. Edouard Boeckmann.

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

"NON-MEDICAL INSURANCE"

Recently one hundred and fourteen life insurance companies in the United States and Canada reported favorably on their experience with non-medical life insurance in America. The report was given by the companies comprising the American Life Convention at St. Louis. It covered approximately ten years' experience with this type of non-medical business since a Canadian company made its first non-medical experiment, shortly after the Great War.

What is the significance of this radical change in insurance practice?

Dr. C. N. McCloud, Medical Director and Vice President of the Minnesota Mutual Life Insurance Company, of St. Paul, has the following comments to make:

> "The cursory, superficial insurance examination, ordinarily given by the insurance medical examiner, apparently bears no significant relation to the life prospects of the average healthy person under forty-five.
>
> "That being the case there is no good reason why insurance companies should pay the large added medical bill for these restricted cases. In the last two years in the United States and Canada, insurance companies saved approximately $9,000,000.00 in medical bills on their non-medical insurance business.
>
> "Naturally a physician's examination is necessary beyond the age of forty-five and wherever there is a question about the health of the prospect."

Dr. E. K. Geer, St. Paul, who handles a considerable amount of insurance work for several companies, agrees with Dr. McCloud that the usual brief insurance examination is of no great significance, either to the patient or to the insurance company. He says:

> "The favorable results reported by insurance companies with their non-medical business looks, on the face of it, like a rap at the medical profession.
>
> "It is really a rap at the usual insurance examination, that is usually required. A real physical examination, to elicit all of the truth about a patient, is expensive and requires time. It is seldom done for the small fee normally allowed by insurance companies for the purpose.
>
> "I am chiefly concerned with the effect that this reversal of insurance practice may have on the campaign for periodic health examinations for which they have been the most effective sponsors.
>
> "Will public health work in America be seriously retarded by this new turn in life insurance practice? It seems to me a serious question."

Non-medical insurance is written by agents who qualify for the privilege with their companies. It rests upon a keen layman's opinion of the general appearance of the prospect and the questionnaire concerning the history and heredity which he fills out. This report, is, of course, substantiated and checked with the confidential report provided by the effective detective service maintained by all life insurance companies.

It is written only for persons under forty-five and in some cases only for single women. In every case it is written only for small policies of not more than $2,500.00.

OBITUARY

Bernard Stanton Bohling

1887-1930

Bernard Stanton Bohling was born in Cumberland, Iowa, August 4, 1887. At the age of seven he moved to Lewis, Iowa, where he was graduated from High School. He then attended Northwestern University, where he received his medical degree in 1912.

After serving his internship he went to Sandstone, Minnesota, where he practised his chosen profession until his death, December 20, 1930.

On April 4, 1914, he was united in marriage to Miss Doris Barr at Chicago, who, with two uncles, are the only relatives left to mourn his untimely end.

He joined the Masonic Lodge before he came to Sandstone and was Worshipful Master of Sandstone Lodge 254 A. F. & A. M. for two years.

During the World War he saw service in France in the Medical Corps. He was a member of the Chisago-Pine and Minnesota State Medical Societies and a Fellow of the A. M. A.

Dr. Bohling was a man of outstanding ability in his chosen profession and will be greatly missed by his medical associates. Sandstone has lost one of her most valuable citizens, but his memory will long remain.

Dr. William Dodge

1856–1931

Dr. William Dodge died at his home in Los Angeles in January, 1931, at the age of seventy-three.

Born in Beetown, Wisconsin, on April 24, 1856, he spent his boyhood and received his early education there. In 1878, he was graduated from the Medical College of Keokuk, Iowa, and began practice at St. James, Minnesota. Four years later, he moved to Henderson, Minnesota, and after two years there, moved to Le Sueur in 1883. The same year, his first wife, Rose A. Simpson, passed away, leaving him two children, Laura and William Jr. In 1884 he married Lydia Smith of LeSueur. Two children, Alma and John, were born to them. After practicing four years in Le Sueur, at a time when practicing medicine was a rigorous occupation, he moved to California, where he has practiced in Los Angeles since. He was one of the organizers of the Los Angeles County Medical Society, and in 1893 was its president. In the early nineties, he was a devotee of horseback riding and owned a large stable of thoroughbreds. He was a founder and one of the presidents of the Los Angeles Riding Club.

Dr. Dodge was a descendant of a long line of physicians dating back to the Revolution. He was a member of the Hollenbeck Lodge of Masons, Al Malaikah Temple, and the Maccabees.

Shortly before his illness, he was the guest of honor at a meeting of the Los Angeles County Medical Society, and was presented with a gold medal in recognition of his services.

Besides his widow and four children, he is survived by two brothers, Dr. Frank Dodge, of Le Sueur, and John Dodge, of Woonsocket, South Dakota.

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MEXICAN "DOCTOR" SENTENCED TO WORKHOUSE

State of Minnesota vs. Fernandez

Averlino Fernandez, twenty-seven years of age, formerly of Monterey, Mexico, was sentenced to one year in the Workhouse in the City of St. Paul by the Honorable John W. Boerner, Judge of the District Court, on January 12, 1931, following the entering of a plea of guilty by the defendant to a charge of practicing healing without a Basic Science Certificate. Defendant had been in St. Paul about sixty days at the time of his arrest. He had no medical experience, but had worked in a drug store in Monterey, Mexico. He confined his practice to the Mexican people in St. Paul and South St. Paul. Judge Boerner informed the defendant that if a future complaint was made against him he would be placed in the Workhouse and made to serve the sentence without any opportunity of having a trial.

In addition to the splendid attitude displayed by the Court, Mr. Brist, representing the State Board of Medical Examiners, reports a fine spirit of coöperation received from Michael F. Kinkead, County Attorney, Thomas A. Brown, chief, St. Paul Police Department, Sheriff Moeller of Ramsey County and Sheriff Maher of Washington County.

APPELLANT IN BASIC SCIENCE LAW CASE PLEADS GUILTY

State of Minnesota vs. Broden

On Tuesday, December 16, 1930, A. H. Broden, the defendant in the above entitled action, entered a plea of guilty to practicing healing without a Basic Science Certificate in the District Court of Duluth. The Court imposed a fine of $25.00.

It will be recalled that Broden, following his arrest on a charge of practicing healing without a Basic Science Certificate took his case to the Supreme Court, where, on the tenth day of October, 1930, the law was upheld. Broden claimed to be a Naprapath. He has been residing in Superior, Wisconsin, for some time, and this fact, coupled with the large expenditure made by the defendant in the appeal of the case to the Supreme Court, undoubtedly occasioned the modest fine imposed. It has been reported that Broden's health has been failing for some time, and that he is at present under the care of a physician and surgeon. Mr. Brist, attorney for the State Board of Medical Examiners, was not present in Court when the case was disposed of on account of the failure of Mr. Forbes, the County Attorney, to notify Mr. Brist that the case would be disposed of on that day.

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have under my care two men with chronic gonorrheal infections.

One, age 28, had infection for past five years, and has been under treatment intermittently for two years and constantly for past three months. During this latter period he has been treated twice a week with sounds up to F.32 followed by potassium permanganate irrigations of 1–5000 for three week periods and then prostatic massages twice a week for another three week period. Urine, glass No. 1, shows a very few shreds and is clear, and glass No. 2 shows one or two shreds occasionally and is clear. The mid-portion of the prostatic gland feels soft and examination of prostatic secretion under microscope shows fifty to sixty pus cells with a few clumps of four to six cells per high power field. He now has a small amount of watery secretion in the morning.

The reason for his taking treatment was a persistent ache at the base of the scrotum in the prostatic region. Since being under steady treatment, the patient states that at times this ache seems better and at other times worse; but there has not been constant steady improvement in this symptom.

The other patient, age 32 years, was treated from June to November, 1927, for a gonorrheal infection and discharged as cured. During that period he was treated with dilatations with a Kollman dilator followed by .25 to .5 protargol and was given prostatic massages. He remained symptom-free until in May, 1930, when he began to have an ache at the base of the scrotum in the prostatic region.

He was married about March, 1930. He has been treated since July, 1930, in the same manner as the other case which has been just described. Urine, glass No. 1 at the present time is clear with three to five shreds, and glass No. 2 clear with very occasionally one shred. Examination of prostatic secretion under the microscope shows the high power field loaded with pus cells, which are occasionally clumped. The prostate gland now feels slightly larger than normal and firm. There is no other symptom except the ache mentioned before, and he does not notice this very much when he is busy or occupied.

These two cases I have diagnosed as chronic gonorrheal prostatitis, but the treatment given them has not improved their subjective symptoms, and the examination of the prostatic secretion has not shown improvement.

Answer.—These two cases are similar and will be discussed together. Persistent ache in the perineum is the chief complaint in both. Gonorrheal urethritis was acquired five years ago in the first and three and one-half years ago in the second case. There has been no urethral discharge for many months except for an occasional watery drop in case one. Gonococci have not been demonstrable in either case for more than a year. Voided urines show glass No. 1 clear with a few shreds and glass No. 2 clear with no shreds. Microscopic examinations of the expressed prostatic secretions show large numbers of pus cells. Prolonged courses of treatment by prostatic massages, dilatations of the urethra and irrigations or injections have only temporarily benefited both.

Further investigation of these cases is advisable before considering future treatment. The anterior urethra should be examined for mural infiltrations and enlarged and tender littré glands by means of acorn exploratory bulbs and palpation over large sized sounds. The prostate and seminal vesicles are next investigated. These structures are best palpated bimanually. With the patient bent over and the elbows resting on the knees the examiner introduces the index finger of the right hand into the rectum well beyond the base of the prostate and the left hand is placed on the lower abdomen. By exerting pressure downward and inward with the left hand, the base of the bladder, the seminal vesicles and the prostate are brought down within easy reach of the examining finger. The size and consistency of the vesicles are noted and they are emptied of their contents by stripping with the finger. Palpation and massage of the prostate is then performed and the secretions are pushed downward into the anterior urethra and gathered on a slide for microscopic examination. The posterior urethra is examined for the presence of granulations with the urethroscope. Polyps, granulomata and lymphocystic bodies are not infrequently found in such cases and may entirely explain the symptoms complained of.

The results of these examinations will indicate the treatment. Mural infiltrations or enlarged tender littré glands of the anterior urethra are treated by full dilatation with sounds and massage over these instruments, followed by permanganate lavages. Prostatic massages should be continued in both cases and performed vigorously enough to thoroughly empty the gland of all inflammatory products. This is best accomplished by the bimanual method described. Infected seminal vesicles are emptied by stripping at the same time the prostate is massaged. The secretions from these structures are collected and examined microscopically to determine the progress of the case. Dilatation of the posterior urethra with the Kollman dilator to 35 or 36F should be occasionally done before massage. Each treatment is concluded by an antero-posterior injection of 2 per cent mercurochrome. Occasional cases of seminal vesiculitis are very resistant to treatment. Puncture of the vas and injection of the vesicles with protargol solutions has been tried in such cases but is of doubtful value. Hot rectal douches several times daily will hasten resolution in the prostate and seminal vesicles. Granulations of the posterior urethra are destroyed by fulguration or by topical applications of 20 per cent silver nitrate solution through the endoscope.

It should be possible to relieve each of these patients of the perineal ache complained of if

(Continued on page 271)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association
Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of March will be as follows:

March 4—The Rheumatic Child
March 11—Treatment of Insomnia
March 18—Cause of Meningitis
March 25—Cancer of the Bladder

RICE COUNTY MEDICAL SOCIETY

The annual meeting of the Rice County Medical Society was held February 4 in the Main Building of the School for the Feeble Minded at Faribault, in conjunction with the Medical Auxiliary. Dinner was under the supervision of Dr. and Mrs. Murdoch and those present were entertained by the pupils of the school. The meeting was called to order by the president of the Society, Dr. J. M. Murdoch. Mrs. A. M. Hanson, president of the Auxilary, preceded Dr. Horace Newhart of Minneapolis, who spoke on the subject of "Mastoid Possibilities."

C. J. Plonske, *Secretary.*

WASHINGTON COUNTY MEDICAL SOCIETY

The Washington County Medical Society held its monthly meeting February 10, 1931.

After dinner the guest speaker, Dr. F. E. Burch of St. Paul, gave a very interesting illustrated lecture on "Strabismus." The doctor kindly answered a number of questions.

E. Sidney Boleyn, M.D.,
Secretary.

WEST CENTRAL AND KANDIYOHI-SWIFT SOCIETIES

The West Central and Kandiyohi-Swift County Medical Societies held a joint meeting at Benson, January 21, 1931. A banquet was served at the Congregational Church Parlors.

Mr. Marcus Shellander of St. Mary's Hospital, Minneapolis, gave a demonstration of laboratory methods which are of practical value to the general practitioner. Mr. F. A. Augustin presented some movie films being shown by the Petrolagar Laboratories.

C. L. Scofield, *Secretary.*

MINNESOTA RADIOLOGICAL SOCIETY

The midwinter meeting of the Minnesota Radiological Society was held February 14, 1931, at the Minnesota Club, St. Paul, Minnesota. The following program was presented:

Round Table Discussion of Cases of Diseases of the Bones and of the Thorax
Conducted by
Dr. R. G. Allison, Minneapolis

Round Table Discussion of Cases of Diseases of the Gallbladder and of the Gastrointestinal Tract
Conducted by
Dr. John D. Camp, Rochester

Roentgenologic Changes Seen in Cases in Boeck's Sarcoid and Related Lesions
Dr. S. A. Morton, Rochester

A Correlation of the Various Factors Involved in the Classification of Chronic Arthritis
Dr. M. J. Shapiro, Minneapolis

Pulmonary Metastases
Dr. Eugene T. Leddy, Rochester

The Medical Histories of Cases of Carcinoma of the Stomach
Dr. Jacob Sagel, Minneapolis

Leo G. Rigler, M.D., *Secretary.*

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The American Association for the Study of Goiter will hold its meeting at Kansas City April 7, 8 and 9, 1931. The following Minnesota physicians appear on the program: Dr. H. S. Plummer, Rochester; Dr. J. F. McClendon, Minneapolis; Dr. Martin Nordland, Minneapolis; Dr. John Pemberton, Rochester; Dr. James Hayes, Minneapolis. The meeting will consist of clinics, symposia and addresses.

(Continued from page 270)

the investigations mentioned are made and the program of treatment followed. However, a small number of cases of prostatitis are incurable. In some of these cases there is no history of gonorrheal urethritis. In these cases the prostate is enlarged, boggy and riddled with small abscesses. Treatment is ineffective and often aggravates the symptoms, in which event it should be discontinued.

2. *Question.*—A young lady, age 25, consulted me in regard to what appears to be alopecia areata. The condition has existed for about six months, the symptoms being loss of hair in region of eyebrows and upper eyelids. There are some fine hairs and some short black stubby ones. Some hairs removed show a little enlarged condition. History and physical examination otherwise is negative. I have used the quartz light and prescribed ointment containing salicylic acid, sulphur and tar.

   Answer.—The diagnosis is probably alopecia areata. No known etiology has been demonstrated. All dermatologists advise rubifacients. Glandular therapy is without avail. Ultra-violet radiation at times does good. The prognosis is usually good, and psychotherapy should be directed along these lines.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. S. S. Hesselgrave, St. Paul
Chairman Press and Publicity—Mrs. E. A. Meyerding, St. Paul
Editor—Mrs. A. A. Passer, Olivia

PANORAMIC VIEW OF THE WOMAN'S AUXILIARY TO THE A. M. A. IN FOUR ARTICLES

1. THE EASTERN DISTRICT

MRS. W. WAYNE BABCOCK

According to the Constitution of the National Auxiliary the First Vice-president is automatically chairman of organization, the three other Vice-presidents being organizers for their section of the country. Mrs. Southgate Leigh of Virginia, therefore, holds this chairmanship, and the Eastern District is her particular responsibility. At her request a series of four articles is being prepared by her committee in order that each district may be cognizant of the progress of its own state as well as those of the other three sections. The individual state journals have been generous in extreme in the space they have allowed their auxiliaries and this additional courtesy of reporting the auxiliary situation in other states is deeply appreciated, for there is a growing desire to know "what others are doing."

New Hampshire stands alone as the only New England state 100 per cent organized and coöperating with the National Organization. Last year the state auxiliary had misgivings as to its necessity and usefulness, but an urgent request from the medical society that the women remain organized, dispelled all doubts. During the year following, Mrs. Hubbard, wife of the State President, visited every county, which encouraged and stimulated the growth of unit auxiliaries.

The New Jersey Auxiliary made pilgrimages to state institutions, set apart one meeting when the mothers of physicians were entertained, and sponsored various health meetings. The Essex County Auxiliary, assisted by the physicians, succeeded in establishing a course of health talks, in coöperation with the Y. W. C. A. of Newark, emphasizing especially prenatal care and information which would aid the mothers of babies and young children. Last year Mrs. James Hunter, Jr., New Jersey's State President, visited every county, as did Mrs. Walter Jackson Freeman in Pennsylvania, during her Presidency. One cannot help drawing the conclusion that personal contacts are necessary for county development and success.

Virginia is active in spots. The doctors encourage the auxiliaries as they believe that through them education with regard to the menace of state medicine can be spread.

Ohio for several years has been sending representatives from a few organized counties to the National meetings, but as yet there is no state organization. As our friend and advisor, Dr. Upham, lives in Ohio, it is felt that he will advise the National Auxiliary when the auspicious time arrives for the establishment of a State Auxiliary.

The District of Columbia seems so completely diverted with Washington affairs that the auxiliary which so capably cared for the A. M. A. meeting some years back seems to have gone into retirement.

Delaware in a breathless, better-late-than-never manner, has completely caught up and is most interested and active and has entered upon serious work by assisting the men of the profession in establishing a medical library in Wilmington. They will coöperate with Philadelphia at the time of A. M. A. and the eastern section will introduce them with pride to the National Organization. West Virginia is up and doing and you may expect still better things from that State this year.

Maine, Massachusetts, Rhode Island, Vermont and Maryland have reported the interest of individuals but no organized effort. Queries from different localities in New York as to why there is no auxiliary have been answered with the statement that several years ago the House of Delegates voted unanimously in favor of the auxiliary and authorized its organization. The same year Connecticut voted favorably but no definite steps have been taken.

Pennsylvania has surely discovered the rhythm in which its auxiliary work is best done, for concrete accomplishments have been turned out regularly, year by year. Of the three thousand dollars contributed last year to the Medical Benevolence Fund more than two-thirds was contributed by the Auxiliary. A definite trend toward educational meetings is felt all over the state and socially it is hoped that the carefully formed Philadelphia plans for the next meeting will bring honor and glory to the Keystone State. Not only are the adult members of the auxiliary meeting, but a group of the most charming and good-looking daughters of doctors are working together in order that they may know each other and work in unison for the comfort and pleasure of the A. M. A. guests when they come to Philadelphia in May. Verily, who can question the wisdom of the auxiliary, when it brings about so much willing work in behalf of the medical men of the country?

The midwinter meeting of the Executive Board of the Women's Auxiliary was held in the Colonial Room of the Lowry Hotel, Friday, February sixth. Luncheon was served at 12 o'clock, and the meeting was called to order by the president, Mrs. S. S. Hesselgrave. There were twenty-eight members present. Dr. L. Sogge, president of the State Medical Association, was the speaker for the occasion. He stressed the importance of past medical legislation and of present pending bills which are of interest to the medical profession, and advised that the Auxiliary members keep posted on current legislation. During the business session reports were given by the state officers, county presidents, and chairmen of committees.

Mrs. J. M. Murdoch was appointed chairman of Hygeia. Arrangements for the entertainment of the guests were made by Mrs. H. T. Nippert and Mrs. P. Roy of St. Paul.

HENNEPIN COUNTY AUXILIARY

The Women's Auxiliary of Hennepin County recently gave $50 to Glen Lake Sanatorium for their library and also purchased a five dollar Christmas Seal Bond. The annual meeting was held January 28, at the Business Women's Club, Minneapolis. Among the revisions of the Constitution, which were adopted at this meeting, were a raise in dues from one to two dollars a year, and the changing of the date of the annual meeting from January to March, and also includes three new officers, namely, a president-elect, a parliamentarian, and a custodian.

Officers elected for 1931 are: President, Mrs. Martin Nordland, Robbinsdale; president-elect, Mrs. Hugh Tunstead; first vice president, Mrs. J. S. Reynolds; second vice president, Mrs. S. H. Baxter; recording secretary, Mrs. Fred Pratt; corresponding secretary, Mrs. Daniel Bessesen; treasurer, Mrs. G. G. Eitel; auditor, Mrs. E. T. Evans; parliamentarian, Mrs. W. J. Brynes. An Advisory Board for the Auxiliary was appointed by Dr. S. H. Baxter, president of the Hennepin County Medical Society, consisting of Dr. Rood Taylor, Dr. Theodore Sweetser, and Dr. Cecile Moriarity.

PARK REGION AUXILIARY

A business meeting was held in January, at the home of Mrs. W. L. Burnap, of Fergus Falls, followed by a social hour. It was voted to send $15 to the Otter Tail Sanatorium to be used as a revolving fund for their industrial work. Mrs. E. R. Saethre, of Alexandria; Mrs. F. H. Vail, of Henning, and Mrs. A. C. Baker, of Fergus Falls, were appointed to investigate future projects for the Auxiliary. Mrs. Theo. Satersmoen, of Pelican Rapids, was appointed a legislative member. Mrs. C. O. Estrem, of Fergus Falls, was elected president for 1931.

RAMSEY CONTY AUXILIARY

Mrs. H. O. Skinner, 2190 Princeton avenue, St. Paul, was hostess to the Women's Auxiliary to the Ramsey County Medical Society, at her home, Monday afternoon, January 26. In reviewing activities of the organization it was reported that more than $200 had been spent on philanthropic endeavors, the organizations benefited including the Jean Martin Brown Home; Shoe and Clothing Committee of the St. Paul Council of Parent-Teacher Association; Volunteers of America; Goodwill Industries; United Charities for Children at Christmas. The Auxiliary also provided fifteen dinners and sent jellies and jams to institutions as well as assisted with sewing and mending for the Gillette Hospital for Crippled Children at Phalen Park and the Children's Preventorium at Lake Owosso.

WRIGHT COUNTY AUXILIARY

Officers for the Wright County Auxiliary are: President, Mrs. J. J. Catlin, Buffalo, secretary-treasurer, Mrs. George Norris, Annandale. The regular meeting was held at Monticello, the twenty-ninth of January.

RICE COUNTY AUXILIARY

The Rice County Auxiliary was entertained in December at the home of the president, Mrs. A. M. Hanson, of Faribault. After the business session the members devoted their talents to the task of dressing twenty dolls and making art books. These dolls and books were presented to the St. Lucas hospital in Faribault and the City Hospital in Northfield. Plans were made to keep the children in the hospitals supplied with dolls and books.

In January four Auxiliary members were guests of the Ramsey County Auxiliary, at a regular meeting, in St. Paul. The February meeting was held at the home of Mrs. J. M. Murdoch.

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of January 14, 1931

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club, Wednesday evening, January fourteenth, 1931. Dinner was served at 7 o'clock, and the meeting was called to order by the president, Dr. J. S. Gilfillan, at 8 o'clock. There were forty-one members and one visitor present.

Minutes of the December meeting were read and approved.

The president appointed a committee, consisting of Dr. J. F. Fulton (chairman), and Drs. Geist and F. R. Wright, to draw up resolutions on the death of Dr. F. A. Dunsmoor.

Upon ballot the following men were elected as candidates to the Academy: Saint Paul, Dr. Max H. Hoffman, Dr. John F. Noble, Dr. Clayton K. Williams; Minneapolis, Dr. Moses Barron, Dr. Kenneth Bulkley; University, Dr. Irvine McQuarrie, Dr. O. H. Wangensteen.

Dr. Emil S. Geist (Minneapolis), retiring president, then read his Presidential Address, entitled, "The Intervertebral Disc." This was illustrated by numerous lantern slides. There was no discussion of the paper.

The meeting adjourned.

R. T. La Vake, M.D.,
Secretary.

KOTEX

Because of inquiries received in regard to the nature of the deodorant present in the widely advertised sanitary napkin, Kotex, the A. M. A. Chemical Laboratory examined the product. A specimen was labeled "Genuine Kotex Deodorized." An enclosed circular contained the statement: "Kotex is odor-proof. A mild, pure, safe antiseptic removes any danger of offense during the use of Kotex." The Laboratory found the Kotex pads to contain an amount of boric acid which is too small to be considered of value as a deodorant. (Jour. A. M. A., January 17, 1931, p. 193.)

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of January 6, 1931

The regular monthly scientific meeting of the Minneapolis Surgical Society was held in the lounge of the Hennepin County Medical Society in the Medical Arts Building on Tuesday evening, January 6, 1931, at 8 o'clock.

The meeting was called to order by the President, Dr. A. T. Mann. There were twenty-five members and nine visitors present.

The President announced the Annual Meeting and Banquet which would be held on the evening of February 5th at the Nicollet Hotel.

The scientific program was as follows:

Dr. Ivar Sivertsen reported a cast of "Exophthalmic Goiter Complicated by Pregnancy."

A case of exophthalmic goiter complicated by the presence of a pregnancy is always interesting, especially in view of the divergence of opinion held by the profession. Gillharn stated that "a woman with exophthalmic goiter should not marry; if she marries, she should not become pregnant; if she becomes pregnant, she should be aborted." Strause, Falls, Mayo Clinic and Lahey Clinic have claimed there was no evidence that pregnancy influenced the course of exophthalmic goiter. Since the use of Lugol's solution became popular in 1923, preliminary ligation ceased to be used to any extent and the Mayo Clinic and Lahey Clinic find that patients with exophthalmic goiter, although pregnant, may be treated medically and surgically with no more risk than in the non-pregnant case. Many obstetricians prefer conservative treatment during pregnancy to be followed by surgery after delivery. In either case the effect on the newborn is the same—nil.

In support of the view that a patient with exophthalmic goiter becoming pregnant may be operated upon without injury to mother or child, the following case was presented:

No. 30762, Mrs. A. G. N., housewife, aged 39, born and raised in this vicinity, the mother of three children (the youngest of which was five), noted an enlargement of her neck about a year prior to her first visit to the clinic. She had noted in the last five months increasing nervousness, weakness, profuse perspiration with tachycardia and palpitation, loss of weight in spite of good food intake. There were no gastrointestinal symptoms. She had not menstruated for two months.

Her family history disclosed the fact that her father, mother, a brother and two sisters were living and all were well except her father, who had a cancer of the lip. She had always been in good health prior to the last year.

Examination on June 7, 1929, disclosed evident loss of weight, thyrotoxic appearance, an enlarged thyroid moderately soft with bruit present. The blood pressure was 160 systolic, 70 diastolic; temperature 98.6°; pulse 134; heart normal except for rapidity, lungs clear, abdomen normal, teeth and bones normal. The uterus was enlarged, cervix softened, adnexa normal. Hemoglobin was 80 to 85 per cent, R.B.C. 4,800,000, W. B. C. 8,400. The urine contained one plus sugar, a trace of albumin with a few white cells, epithelial cells and bacilli. Meinecke was negative.

Diagnoses were: (1) exophthalmic goiter; (2) pregnancy.

Hospitalization was recommended. The patient entered Fairview Hospital June 10, 1929. The basal metabolism was plus 74 per cent; and checked four days later was plus 76 per cent. She was placed on light diet, Lugol's solution min. 10, p. c., ice locally, and bromides. History was then elicited that the patient, while ambulant, took Lugol's solution seven weeks prior to admission to the hospital. The tremor subsided and the general condition improved so that Lugol's was discontinued after eleven days in the hospital. Four days later the right superior thyroid artery was ligated under novocaine, without distress. Four days later the left superior thyroid artery was ligated under gas anesthesia, without distress. Six days later Dr. S. R. Maxeiner was called in consultation, and reported as follows: "The patient was seen in consultation with Dr. Ivar Sivertsen at 5:45 p. m., July 5, 1929, at Fairview Hospital. The history and physical examination, as recorded by Dr. Sivertsen, and the hospital records were reviewed. The patient's general checkup of hyperthyroidism was made. The patient is running a pulse of 135 and the blood pressure is 135/60, with marked tremor, exophthalmos, and palpable thyroid. Pelvic examination was not made but Dr. Sivertsen states that the patient is more than four months pregnant. I agree absolutely that this is a case of exophthalmic goiter, and that surgery will be the natural treatment in her case. In spite of the fact that the patient is pregnant, the pregnancy is so early that we have no assurance that the patient will not abort and the pregnancy be naturally discontinued because of her thyrotoxic condition. As a result, I believe that the patient herself is the most to be considered in this particular instance and that surgery should be employed as soon as indicated. I would suggest that the patient be given large doses of Lugol's for a few days in an effort to slow the pulse and possibly put her in better condition for operation. If she does not respond to treatment, it may be necessary to resort to surgery in view of the fact that she is losing weight rapidly. (Signed) Dr. S. R. Maxeiner."

Eight days later, during which time weight loss and tachycardia had continued, a thyroidectomy was performed under novocaine and ethylene anesthesia. Her postoperative convalescence was uneventful. She sat up on the tenth day and left the hospital on the sixteenth day postoperative.

The laboratory diagnosis was toxic adenoma.

One month postoperative, the patient had increased in weight and strength and felt well; the pulse was 80, and the pregnancy undisturbed. Three months postoperative, the weight continued to increase, the blood pressure was 140/80, and the pregnancy o.k. Nine months postoperative, the patient reports that a normal baby was born five and one-half months postoperative. The delivery was normal, and conditions normal. Nineteen months postoperative, the patient's weight was 144 pounds (formerly 114 pounds), and she was well and healthy.

DISCUSSION

Dr. E. K. Green said that Dr. Sivertsen's case, with his modern up-to-date treatment, reminded him of a case which he had seen with the late Dr. L. A. Nippert about twenty-nine years ago. The patient was a woman about 40 years of age, with all the physical signs and symptoms of a marked Graves' disease, who had come to full term with nothing but symptomatic treatment. The exophthalmos was extreme; she had a large thyroid, very fast pulse, and was very nervous. The family was desperately poor and while Dr. Green gave the chloroform (in a small 10 × 12 bedroom) Dr. Nippert had delivered a perfectly normal baby that was stillborn because of a protracted difficult labor. Somewhat to their surprise, the patient made an uncomplicated recovery from the labor.

Dr. Green added that the patient has never had surgical interference and when he saw her about two years ago, while she was in rather poor health, she was able to get about and do her housework.

Dr. A. A. Zierold asked how a diagnosis of toxic adenoma could be made in the laboratory.

Dr. Martin Nordland was of the opinion that it is characteristic that pregnancy has a tendency to aggravate the usual toxic symptoms of the thyroid, and if this were toxic adenoma it would perhaps account for the high basal reading of 74. The incidence of toxic goiter in pregnancy, according to Mayo, is 0.6 per cent. Pregnancy usually lights up the symptoms of toxic goiter, and he recalled a case where these symptoms subsided and the patient got along relatively well after the pregnancy ceased.

Dr. J. M. Hayes asked if the basal metabolic rate had been checked up after delivery and, if so, what it was.

Dr. Sivertsen stated that he did not take it afterwards. As far as the laboratory diagnosis of toxic adenoma was concerned, which Dr. Zierold questioned, Dr. Sivertsen had not accepted that. His own diagnosis in the case was toxic goiter. As to pregnancy in goiter cases, it is known that pregnancy increases the metabolic rate and pregnancy increases the toxicity of the gland. Lahey's figures show only 0.4 per cent, while Mayo shows 0.6 per cent of hyperthyroidism in pregnancy.

Dr. A. T. Mann said, in relation to Dr. Zierold's comment, that if the laboratory men looked at the mass that was taken out and found an encapsulated mass they would feel that it was an adenoma.

Dr. Zierold said some one asked if this was a toxic adenoma or exophthalmic goiter. He felt there was no question about the accuracy of laboratory diagnosis of adenoma of the thyroid or of Graves' disease, but he did not know of any one yet who is able to make a diagnosis of toxic adenoma under the microscope.

Dr. R. C. Webb read a short paper and reported a case of "Hyperthyroidism Complicating Diabetes Mellitus" (to appear in MINNESOTA MEDICINE at a later date).

DISCUSSION

Dr. R. F. McGandy stated that he had heard two very interesting case reports this evening, but that he was just now interested in another phase of the subject and would appreciate an expression of opinion from Dr. Webb or Dr. Sivertsen (or any of the members) concerning, in particular, the causative factors in hyperthyroidism and whether or not one could justifiably say that nervousness or some emotional strain could cause hyperthyroidism. He was not referring to a preëxisting hyperthyroid which was aggravated by these factors, or to a preëxisting nervous system which the excitability may have precipitated. But he would like to have an expression as to whether one could say that some nervous shock, such as might follow an accident, could cause hyperthyroidism.

Dr. Webb suggested that several of the members present had had experience with hyperthyroid cases and if any of them had been associated with trauma he would like to hear of their cases.

Dr. Mann stated that it is well established in the literature, and all the men had been getting it in lectures for years, that shock is one of the manifestations of hyperthyroidism.

Dr. McGandy said this really was quite a question. He had recently seen three cases in which this had been a disputed point. While it was true that this had been taught as a cause of hyperthyroidism, Dr. McGandy felt that authors in recent years had been evading this phase, and only today he had read an article by a man who also seemed to evade the issue but placed nervous shock in the group of hereditary factors. Dr. McGandy would grant that an accident might precipitate the condition in one who had an inherently unstable nervous system; but could it do so in a person who is normal?

Dr. W. P. Herbst related some work which, however, was not conclusive because it was not completed. A man by the name of Duranti had made serial sections in the cervical sympathetics in exophthalmic goiter and reconstructed them in models. He was working on the theory that the amount of chromatin granules in the cervical sympathetics had something to do with exophthalmic goiter. On that basis one could figure out that shock might play a part in the production of exophthalmic goiter by the result of psychic shock on the sympathetic system.

Dr. Mann said that it is very definitely known that the chromaffin system, of which the cervical sympathetics are a part, has a very considerable influence on the activity of the thyroid gland. Dr. Mann was of the opinion that they were "begging the whole question." Of course if the person had no hyperactivity of the goiter before the shock and had it after the shock, then the shock would be the immediate cause of the upset in the whole complicated system which might have been started in some other way under other conditions.

Dr. Hayes said, in reference to Dr. McGandy's discussion of these cases in court, that it was usually pathetic and humiliating to the honest physician to go into court and tell what he knew about the cause of hyperthyroidism before a jury and an attorney who was attempting to discredit his testimony. No physician can honestly make a definite statement as to the factor injury or accident plays in these cases.

Dr. Nordland felt that the members were confusing the terms "cause" and "influence," as no one knows the cause of exophthalmic goiter. An accident might influence and cause an exacerbation of the symptoms of a toxic goiter in a patient who already has this disorder. He felt that the subject was getting highly theoretical when one considers the cause of thyroid disturbance. Boothby claims that in the average human being there is constantly about 10 mg. of thyroxin present and from 2 to 4 mg. of this is used up each day. Of course there is some mechanism present in the body by which this thyroxin is renewed. It has been considered that the center which controls the production of thyroxin may be somewhere in the brain. If this is true, it is theoretically possible for an accident to aggravate this central control of thyroxin production. Dr. Nordland felt that one could not talk with any degree of certainty about the "cause" of exophthalmic goiter.

Dr. Mann believed that this (the cause of exophthalmic goiter) comes from more than one direction; something which influences the pancreas, or the adrenals and the chromaffin system, or something which influences the gland itself can do it. Of course, the whole thing is under sympathetic nervous control more than anything else but this can be strongly influenced by cerebral impulses of certain types.

Dr. Webb stated he did not believe that hyperthyroidism could be atributed solely to an accident. The cause of this disease is not known but the present assumption is that a preëxisting state was present and that, given such a disease an influenza or other factors, the disease occurred as an exacerbation.

Dr. Arthur L. Herman read his Thesis entitled "Double Branchial Cysts Complicated with Carcinoma of the Larynx" (to appear in Minnesota Medicine at a later date).

DISCUSSION

Dr. James Johnson felt that this thesis was a very interesting one. It was particularly interesting to him since in 1926 he had read a paper on this subject before the State Medical Society in which he had reported five cases. None of them, however, were malignant. He stated the second and third branchial clefts were the ones in which there was most often embryologic defects and remnants. The second cleft, which empties into the tonsillar fossæ, and the third cleft, which enters into the pyriform fossa, were the two involved in Dr. Herman's case. Most often the cyst developed from the outer side of the cleft. However, in this particular instance it apparently developed from the ectoderm and pushed in through to the inside of the larynx. This is an exceedingly rare thing and especially to have such a remnant in this location malignant is indeed a rare situation. Dr. Johnson felt that Dr. Herman should be complimented on the care with which he prepared this case.

Dr. Hayes asked if Dr. Herman stated or had any definite figures as to the percentage of branchiogenetic cysts that had become malignant.

Dr. Mann said that of course the inner attachments of these branchial cysts or sinuses are always high in the neck because the mandible or lower jaw itself is in the first arch and the ear drum closes the first cleft, so it makes us jump to the second at least. The styloid process, the digastric muscle, and the little horn of the hyoid bone to which it runs are in the second arch, and the hyoid body and the greater wings of the hyoid are in the third arch, and the fourth (there is no fifth in the human) gives rise to all the structures of the neck below this. Sometimes one may find the cysts running deep but over the digastric muscle and styloid process when it arises from the second cleft, and running under the belly of the digastric muscle but over the great wing of the hyoid bone when it arises from the third cleft; and it is known that most of them arise from the second and third clefts. And, of course, with these solid growths there will be the question of dermoid inclusions, so when the tumors are of mixed cells they are spoken of as dermoids. Dr. Mann thought it was very rare to have two branchial cysts in the same person.

Dr. Nordland said that he did not understand the explanation Dr. Herman made for the loss of voice in this case. He believed that the pathology described was too high to affect the recurrent laryngeal nerve.

Dr. Herman stated that there were two cysts, one fairly high, but which might cause some pressure on the vagus at least. The other cyst was low enough to cause pressure on the inferior laryngeal nerve.

Dr. Nordland stated that he did not believe that pressure on the vagus alone would affect the voice.

Dr. Herman said that in this particular case the aphonia was much more apt to be due to pressure from the cyst within the larynx.

In answer to Dr. Johnson's question, Dr. Herman said that while he had no way of absolutely establishing the location of the cyst, he could only state in agreement with Dr. Phelps and Dr. Spratt, who had seen the patient, that the cyst was in the pyriform recess. The lower external cyst was also at this same level.

In answer to Dr. Hayes' question as to the percentage of branchial cysts which become malignant, Dr. Herman stated that this information was very difficult to obtain from the literature because of the fact that many authors undoubtedly included malignancies which did not have their origin in branchial cysts. Thus some authors included cases which were mixed tumors of the parotid. Others included cases where the possibility of an overlooked primary lesion in the nasal sinuses or larynx had not been properly ruled out.

In this connection he mentioned a case that was thought to be a malignancy of a branchial cyst, whereas at autopsy the primary lesion was found to be a minute carcinoma in the larynx. In other cases the primary lesions were found in the nasal sinuses. If autopsies had not been performed on these cases, they would have gone into the literature as branchiogenic malignancies. So, both because of failure of all cases to be autopsied, and because of lack of agreement as to just what constitutes a branchiogenic tumor, the figures in the literature are too high.

Dr. Mann asked Dr. Herman when the diagnosis of carcinoma was first made; whether it was on the first biopsy.

Dr. Herman said it was not made until the second biopsy.

Dr. Mann asked as to the type of carcinoma.

Dr. Herman stated that it was squamous cell.

Dr. Martin Nordland read a paper, illustrated with lantern slides, entitled "Increased Susceptibility of the Hyperthyroid Patient to Air Embolism, with experimental evidence."

DISCUSSION

Dr. Zierold felt that every one present would agree that this was a most excellent piece of work that Dr. Nordland had done and that he should be extended the appreciation and thanks of the members for bringing it before the Society tonight. He felt that it was an unusual observation, and that it was interesting to note how Dr. Nordland's observations conform to what are apparently unrelated observations on thyroid patients. He thought probably an extension of the series might do away with the false impression created by the record of the last animal in the experiments, as the curves all seemed regular up to that point.

Dr. Zierold called attention to the fact that the pulse pressure in the animals increased with the increase of dosage of thyroprotein; that, of course, conforming to clinical observations in hyperthyroidism. He also mentioned an interesting observtion of the end-results in hyperthyroidism noted by Dr. E. T. Bell. Recently he had examined at autopsy an untreated case of exophthalmic goiter, the only unusual finding being a generalized hypertrophy of the heart—apparently the same picture found in the other extreme, which is myxedema. Dr. Zierold stated that the premise on which Dr. Nordland's work is based is very clear. It would seem from the recent studies that there is a weakened heart muscle in the later stages of hyperthyroidism. If that is the case, Dr. Zierold felt that any mechanical disturbance, such as air embolism, interfering with the function of such a heart would cause the death of the animal sooner; and this is in accord with Dr. Nordland's findings.

There was one suggestion which Dr. Zierold said he might offer which might add to the accuracy of the observations, and that is to obtain the weight of the heart; checking the amount of air in proportion to the weight of the heart, as being a truer measure rather than the weight of the dogs.

Dr. E. A. Regnier asked Dr. Nordland whether or not he had noticed any embolic changes in the coronary vessels of the heart, and mentioned recent work by Rukstinat (Jour. A. M. A., Vol. 96, No. 1, Jan. 3, 1931), whereby he had injected air into the coronary arteries of dogs, with postmortem findings similar to those found by Dr. Nordland. Dr. Nordland mentioned that death seemed to be due to a mechanical obstruction of blood flow to the right heart; and Dr. Regnier felt there was a possibility that embolism of the coronary vessels may have been brought about by his procedures.

Dr. Johnson asked how rapidly this air was injected; whether it was injected slowly, or a given amount of air was injected in a given length of time.

Dr. Leo Murphy asked how often in their experience the members had seen air emboli. He had read about it (particularly in the foreign literature) and had heard about it, but he had never seen it, and was interested to know how many of those present had had any experience with air embolism.

Dr. Mann stated that he had never seen one. There had been a good many operations at the Boston Hospital when he was house surgeon but he had never seen one there nor in private practice. In connection with Dr. Murphy's remark about seeing more of them reported in the foreign literature, Dr. Mann stated that might be due, partially at least, to their method of operating; and then they have much larger goiters as a rule.

Dr. W. A. Hanson said that in reviewing the literature of thyroidectomies, air embolism has occurred few times in this country. Probably cases have occurred which were not recognized as such. Dr. J. Pemberton, in a review of the cases at the Mayo Clinic to 1924, states there was probably one case of air embolism which was recognized at the time of operation in 14,911 resections, and with only three deaths recognized to be due to pulmonary embolism.

Dr. E. T. Evans said that when speaking of "air embolism," one must remember that a good deal of air can be put into the jugular without causing death.

Dr. Webb wondered if among the large number of cases mentioned there were any that died during or shortly after operation and, if so, were they autopsied? He himself had had one case in which he would never have known the cause of death had he not succeeded in getting an autopsy. Dr. Webb was of the impression that there must be a definite condition present in or about the vein which has been cut to permit the air to enter and that this was a very important factor. He recalled a man he had picked up while riding the ambulance in New York. This man, while inebriated, had cut his throat and was lying in a pool of blood trying to sing, with a partially severed trachea.

Dr. Webb thought it would be interesting to know just how toxic Dr. Nordland's dogs had become. He also thought that to render the condition comparable to a patient undergoing operation, the dogs should be fed Lugol's solution and brought back to normal. It would rather seem that a heart which was being whipped on by a toxic goiter was better able to take care of itself under such circumstances than a normal heart. This is especially brought to our attention when one considers the large number of goiter operations performed with an inexperienced assistant catching the bleeding vessels.

Dr. Kenneth Bulkley said he was impressed by what Dr. Murphy said in regard to looking over the literature and the more frequent occurrence of emboli in foreign countries than in this country. Dr. Bulkley said he was in France two and a half years and watched particularly Morestin, who was the best known neck and facial man France had ever produced. Theoretically, Morestin should never have had an air embolism. He operated in a well of blood about two inches deep, had one non-sterile nun and usually only one 12- or 14-year-old boy helping him. He would do a block neck dissection in fifteen or twenty minutes. Dr. Bulkley had seen him do an excision of the tongue and neck dissection in a half-hour.

As to what Dr. Webb said about cut-throats and why they do not get air embolism, Dr. Bulkley stated that he had never seen a case and yet while he was house surgeon at Presbyterian Hospital in New York he was called when two of their old orderlies in a state of depression had cut their throats and neither had air embolism. He had seen two others but neither of them had had air embolism, although there were two immediate deaths in the group, one from immediate hemorrhage and the other later from sepsis.

Dr. Nordland (in closing) stated he wanted to thank the gentlemen for their remarks in the discussions. He appreciated Dr. Zierold's suggestion that the weight of the heart ought to be considered with reference to the effect of the quantity of air that might be injected.

Dr. Nordland believed that the reason why accidental injuries to the veins of the neck, such as cut throats, did not produce air emboli, was due to the fact that these veins were probably cut above the point where they passed through the fascia obliquely. It also might be explained by the facts demonstrated in this study, that it takes larger quantities of air to cause death in the non-toxic individual.

In answer to Dr. Johnson's question with reference to the rapidity of the injection of air, Dr. Nordland said the air was injected at a speed of about 100 c.c. within 2 seconds. The same speed was used for the normal and the toxic animals.

Dr. Murphy's suggestion that reports of death from air embolism were more common in Europe than in this country, might be explained by the fact that, in the past, postmortems were more frequent there than in this country.

Dr. Nordland wished to emphasize again that the object of this experimental work was to find out whether or not the toxic goiter patient was more susceptible to air embolism than the non-toxic patient, and he felt that from the results of this work one could say that the toxic patient was more susceptible.

An Eastman moving picture film of "Simple Goiter" was shown, after which the meeting adjourned.

H. O. McPheeters, M. D.,
Secretary.

PROCEEDINGS OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of December 16, 1930

The Minneapolis Clinical Club had been invited by the St. Cloud Physicians to give their monthly scientific program at the monthly Staff Meeting of the St. Cloud Hospital, which was to be held at the Hospital in St. Cloud on the evening of December 16, 1930.

A bus was chartered and twenty members of the Clinical Club made the trip, arriving at the Hospital for a 6:30 dinner as guests of the Staff. After dinner the doctors adjourned to the Staff Room, where the meeting was called to order by their President, Dr. J. P. McDowell. After a cordial welcome, Dr. McDowell asked the staff members to rise as he called their names, introducing them to the members of the Clinical Club. He then called on Dr. Barron to conduct the meeting, first introducing the members of the Club.

Dr. Moses Barron: It is a pleasure to be here again. I was here once before and enjoyed it so much that I wanted to come again, and we thank you for your kind invitation to come down here and give this program.

The Minneapolis Clinical Club was organized ten years ago for the purpose of giving the younger men an opportunity to get together and meet in a social way to discuss rather informally various subjects in the different specialties. It is composed of the younger men; in fact, our Constitution states that only the younger men may belong. We have 33 members and meet once a month, and this meeting tonight is typical of one of our regular monthly meetings so that you may see just what they are like.

The scientific program consisted of the following papers:

Dr. J. M. Hayes read a paper on "The Treatment of Acute Empyema of the Gallbladder." (Paper not yet published.)

DISCUSSION

Dr. S. R. Maxeiner: I am very much interested in the report of Dr. Hayes' cases, and would have liked very much to have had an opportunity to look up my own records before discussing this paper.

I believe there are perfectly legitimate grounds in this field for differences of opinion and that a lot of these differences of opinion will be based on personal experience, often to the extent of "burnt fingers." During six years of service as surgeon at the Minneapolis General Hospital and approximately eight years of service as consultant for the Government, and in my private practice, I have had occasion to see a good many acute gallbladders and have personally come to the conclusion that, when it is possible to do so, the acute attack should be allowed to subside and the patient instructed to return for subsequent operation when the infection has entirely disappeared. In some instances, however, because the patients did not do well, we have been compelled to treat them surgically, and practically always by drainage rather than by removal of the gallbladder. Following an experience several years ago in which three cases of acute empyema with gangrenous gallbladders died following cholecystectomy, I swung completely to drainage of the gallbladder and since that time have not lost one single acute gallbladder that I have been compelled to operate upon. In the last two or three years, I have operated upon three perforated gallbladders, all of which formed localized abscesses. In these, the abscesses were drained and the stones removed without getting inside the general peritoneal cavity.

Recently, in a conversation with Meyer of Chicago, I find that his experience checks almost directly with my own and in comparing his cases with some of his colleagues who were operating upon acute gallbladders he was convinced that he was following the right plan. Ravdin, of the University of Pennsylvania, at the last meeting of the American College of Surgeons, reviewed their statistics and stated that their mortality was much higher with cholecystectomy than with cholecystostomy in acute gallbladders and that, even though 30 per cent of the drainage cases must return for cholecystectomy, the mortality from the double operation was lower than for removal of the gallbladder during the acute attack. I do not believe that it is possible to differentiate the gallbladder containing pus (empyema) from the severely acute gallbladder that may not be classed as purulent.

Dr. Hayes' findings and his subsequent cases are deserving of close observation and certainly we are all looking for an opportunity to improve our present methods. As for my own experience, I am basing my conservatism on my own lower mortality in conservative treatment of the acute gallbladder.

Dr. O. J. Campbell: I had my fingers burned in the other direction. I was called to see the father of a medical student because of two recent attacks of acute gallbladder disease. He was just recovering from an attack, so we deferred operation. Local tenderness had disappeared and we were on the point of operating, when I was called out of town for two weeks. I advised the student to have another surgeon operate. Returning, I found the patient had waited but was in the midst of another attack. Again we waited for the acuteness to subside but, because of the frequent attacks, feared to defer operation until he had fully recovered.

At operation we found a badly diseased, almost gangrenous gallbladder containing large stones. The common duct was not distended but the pancreas was enlarged and indurated. There was no fat necrosis. I removed the gallbladder feeling that it was too badly diseased to use for drainage. The patient, after an initial rally, died of acute pancreatitis and peritonitis on the tenth day. Extensive fat necrosis was revealed post mortem.

This illustrates to me the fact that in acute cholecystitis we are confronted with a situation where fine surgical judgment is required. We cannot sit tight on all cases, neither should we dogmatically operate all. In the case just cited, had the man been operated when first seen he might have escaped pancreatitis and death.

From the information at hand it is difficult to be sure of what constitutes a conservative attitude. For my own part, conservatism seems to dictate a policy of waiting when the onset is not too stormy nor the attacks too rapidly following each other. When the attack is extremely violent with evidence of rather widespread peritoneal involvement it seems wise to operate. Whether or not the gallbladder is to be removed depends upon the exposed pathology, the age and general resistance of the patient. Where there is no actual abscess surrounding the gallbladder it can apparently be safely removed. In very elderly people, debilitated individuals, and those in whom collections of pus have already gathered outside the gallbladder, conservatism seems to indicate drainage rather than excision.

There is a point in technic which is possibly worth recalling. In dealing with the friable cystic duct, not infrequently the cystic artery becomes loose. Trying to clamp blindly in a well of blood is very dangerous. A finger slipped through the foramen of Winslow will allow the hepatic artery to be compressed between thumb and finger while the blood is sponged out and the artery secured with forceps.

Dr. R. C. Webb: I think the proper word was mentioned when Dr. Campbell said that judgment should be used in acute cholecystitis. I feel that acute inflammation of the gallbladder is a serious condition and a definite rule should not be formulated for such patients as to whether one should permit the disease to subside or as to routine surgical intervention. When a patient has acute cholecystitis the surgeon should ask himself why he should *not* operate. There may be several reasons for not operating, *i.e.,* the disease may be subsiding or there may be other existing diseases in which an operation might create a hazard equal to that of acute cholecystitis.

In October of this year a patient was referred to me suffering severely from an exophthalmic goiter. She could be diagnosed at a glance at some distance and her basal metabolism was 55. On October 6 I performed a partial thyroidectomy and her recovery was very rapid. On October 12 she developed an acute inflammation of the gallbladder and the necessity of a second major operation became apparent and was seriously discussed. I felt that, inasmuch as she had just been through several weeks of hyperthyroidism combined with an operation for goiter, I had a reason for delaying operation. On October 22, however, she had nearly recovered from the goiter operation and the acute gallbladder was not improving so a laparotomy was made. The gallbladder was found full of pus with gallstones and there was a yellow necrotic area on the fundus the size of a twenty-five cent piece where it was about to rupture. The gallbladder was aspirated through this area and a cholecystostomy was performed through a stab wound and she made an uneventful recovery. This patient's record illustrated clearly the dangers in waiting.

In operating upon the acutely inflamed gallbladder a cholecystectomy is ideal treatment, but the conditions vary so much at operation that such a procedure may not be consistent with the life of the patient and a partial cholecystectomy or a cholecystostomy may be all that is possible.

I believe that our policy should be to use surgical judgment, to ask ourselves why we should *not* operate and, when we do operate, to perform an operation that will give us a live patient.

Dr. Hayes (in closing): I did not expect all the surgeons to agree with me on this subject. I never saw a group that did agree on it. However, as has been mentioned, surgical judgment is an important factor. One can usually have some idea as to how much the infection is confined to the gallbladder from the general appearance of the tissues. If the infection has manifestly spread to neighboring tissues and pus and necrotic tissue are present outside the gallbladder, this operation would not be advisable.

In these cases where we have the stone in the pelvis of the gallbladder or close to it and a very evident pressure on the cystic artery, we are quite sure gangrene will result if the process is allowed to advance. This is the case in which I am advocating a cholecystecomy as soon as it can be done. Much of the discussion has not been on this type of case. If you will review the literature closely on this type of case you may plainly see that this condition carries with it a large mortality. If it can be operated very early while the severe infection is still confined to the gallbladder and care is taken to prevent the spreading of the infection, the results are no doubt far preferable to those obtained by waiting.

Dr. E. S. Platou presented a paper (read by Dr. H. B. Hannah) entitled "Poliomyelitis; An Evaluation of our Present Methods of Treatment." (Published in Journal-Lancet, Feb. 22, 1931.)

ABSTRACT OF DR. PLATOU'S PAPER

Poliomyelitis undoubtedly is far more prevalent than is indicated by recognizable forms of the disease, having an age distribution of incidence corresponding somewhat to that of measles and diphtheria, and bearing a rather direct relationship to the density of population.

The serums of convalescents, adult contacts and of the majority of "normal" adults have verucidal properties, indicating that immunity to the disease is rather general, particularly in adults, resulting from recognized and more frequently from unrecognized forms of infection by the polio virus.

The possibilities of effective serum therapy point most favorably at present to the use of convalescent, adult contact, and "normal" adult blood serums. At present the convalescent serum seems to be the serum of choice in the early treatment of poliomyelitis although there is some evidence that adult contact serum may be even more valuable. Should further study demonstrate adult contact and "normal" adult serums to equal or exceed convalescent serum in effectiveness we will imediately be provided with an immense reservoir of anti-poliomyelitis serum for therapeutic use.

If convalescent serum is not available, the blood or serum of adults (preferably contacts) probably will serve as a valuable prophylactic agent.

DISCUSSION

Dr. Barron: We sometimes see sporadic cases of this disease even if it is not present in epidemic form, and I think that we should have quite a general discussion of this paper.

Dr. H. B. Hannah: I would like to add a few words in regard to the early diagnosis of poliomyelitis. A child that comes down with headache, vomiting, some fever, pain in a group of muscles, stiffness of the neck, et cetera, should be looked upon as a possible case of poliomyelitis or beginning meningitis. Early spinal puncture will in many instances make the diagnosis for us. In ordinary poliomyelitis there is not so much stiffness of the neck. I saw a patient several years ago with Dr. Platou and there was a question as to whether it was meningococcic meningitis or poliomyelitis. We decided the child should have convalescent serum. The disease finally turned out as meningitis, but which we were waiting there might have developed symptoms of poliomyelities. In other words, giving poliomyelitis serum does no harm, even if the disease is not present.

Another point is that poliomyelitis is a lower motor neuron lesion and very early the patient will show reflex disturbances, and some muscle or group of muscles in the body become paralyzed, so it behooves every man to go over the body carefully to determine whether there is any weakness anywhere in the body. And convalescent serum should be given, or adult serum used, as early as possible. If given later it is not nearly so effective as if given in the first twenty-four hours.

Dr. G. E. Sherwood (Kimball): I would like to ask what one should do for these patients after their acute symptoms have subsided and they have improved, but there is paralysis left.

Dr. E. T. Evans: This subject is of a good deal of interest to me. I have seen 55 cases of acute poliomyelitis, and have been called in nearly every case at the University Hospital and there have been 28 cases there.

One point about the use of the serum: Flexner states that if you give horse serum to a monkey it takes about 1/10th as much virus to give it polio as the normal monkey. Autopsies of monkeys so treated show minute hemorrhages; in other words the meningeal barrier is broken down. And for this reason I feel that the use of commercial serum may prove dangerous.

In answer to Dr. Sherwood's question about what to do for these patients after the acute symptoms subside, and there is still paralysis, we have had many such cases and we are routinely keeping the patients at absolute rest in plaster-of-Paris bandages and splints, followed by muscle re-education with muscle support and braces after four or six months.

Dr. E. D. Anderson: It seems to me that in examining a child it is very easy to make a hurried checkup on the arms and legs and it should be done routinely. It is a very simple thing and certainly calls your attention to any impairment of the muscles. The easiest way I have found to do this is to have the child grasp my hand and have him squeeze. Then I have him pull and push against my hand. Then I test for Kernig's with each leg and then have him raise his feet from the bed and then have him push with his feet against my hands. It takes only about a minute and if there are any disturbances you are immediately put on the track of them. I always follow this rule, not only when there is an epidemic but when any child is acutely ill.

Dr. J. C. Michael: In Minneapolis we have had, according to our Health Department, some 42 patients with poliomyelitis during 1930. The first case of the year was reported in the month of July. Eight of those patients were over 19 years of age. These figures show that we have not had very many cases; the number if multiplied by ten would indicate a severe epidemic. I have seen two adult cases, both atypical, during the last three weeks. There is one thing about the pathology of poliomyelitis—the very first lesion in the nervous system is meningeal. The pial and arachnoid vessels are surrounded by increasing numbers of lymphocytic cells. This inflammatory reaction incidentally follows gradually the vessels into the cord or brain stem. Hence one looks usually for pain in the head and back, generalized hypersensitivity, twitching, and drowsiness some days prior to a possible paralysis. The mortality rate is higher in the adult patients.

I think Dr. Platou's paper epitomizes very comprehensively many of the important points in poliomyelitis, especially the use of convalescent serum, which has created considerable interest during the last few years.

Dr. H. B. Clark (St. Cloud): I would like to ask how to obtain and handle the convalescent serum.

Dr. H. B. Hannah: In answer to that question, the State Board of Health has this serum all ready to use, but if you can't get that right away you can take the blood from some adult or other children of the family and separate the serum and use that at once until you can get some of the convalescent serum from the State Board of Health.

In answer to the question as to what to do with the patients afterwards, there is some difference of opinion between the neurologists and the orthopedic men. We do nothing until the pain disappears out of a group of muscles, except to keep the patient absolutely at rest. In perhaps one and a half to two years the end-result can be determined. During the early stages deformity must be prevented by putting on some appliance to prevent stretching of the paralyzed group of muscles. Then it is for the orthopedist to handle the case.

Dr. R. G. Allison gave a lantern slide talk on "Foreign Bodies in the Air Passages."

ABSTRACT OF DR. ALLISON'S PAPER

It has always been comparatively easy to demonstrate foreign bodies that were opaque to the *x*-ray. But is was only a few years ago that Manges, who is associated with Jackson of Philadelphia, described certain definite secondary changes in the lungs that enable us to recognize with a high degree of accuracy nonmetallic foreign bodies in the air passages. There are several things that a non-opaque foreign body can do.

1. It may cause an atelectasis of one or more lobes or even an entire lung with a drawing-over of the heart and mediastinum toward the affected side. In this instance the foreign body is completely occluding the bronchus and allowing air neither to enter nor leave the affected lung.

2. It may not quite completely block the bronchus to the lung or a lobe and give a typical picture of a drowned lung. In this instance, there is no displacement of the heart and mediastinum.

3. By far the most common action of non-opaque foreign bodies is that of a ball-valve action by which air is allowed to enter the affected lung, although the ball-valve action of the foreign body prevents it from leaving. In this instance, it is very necessary to obtain plates at the height of inspiration and at the height of expiration for comparison. In the plate made on inspiration the two lungs look practically alike and the heart and mediastinum are in normal or nearly normal position. In the plate made on expiration, however, the air is not allowed to leave the affected lung. For this reason, we obtain a marked emphysema of the affected lung with a marked displacement of the heart and mediastinum toward the unaffected side. This type of behavior is noted in practically all nuts, fruit pits, and other vegetable materials that may be aspirated into the air passages. These changes can best be shown by lantern slides which I will demonstrate.

Dr. H. M. N. Wynne read a paper entitled "Abnormal Bleeding from the Female Genital Tract." (Published in Journal-Lancet, Feb. 1, 1931.)

Dr. R. T. LaVake, who was scheduled to read a paper on "Everyday Obstetric Problems," asked that his paper be omitted in order to give the Minneapolis men time to make a tour of the new hospital after the meeting.

Dr. F. H. K. Schaaf gave a talk on "The Treatment of Cardiac Diseases" with a plea for the more rational use of the drugs most generally in use at the present time.

Dr. Barron (closing the meeting): On behalf of the Minneapolis Clinical Club, I wish to thank the Staff and Management of the St. Cloud Hospital for the very fine dinner and music we have enjoyed this evening, and for the kind invitation which made it possible to hold this meeting together. And I move that a rising vote of thanks be given them for this hospitality. (Rising vote.)

The meeting adjourned, after which the members were escorted on a tour of the hospital.

The return trip to Minneapolis was made by bus, and the consensus of opinion seemed to be that the evening had been a most enjoyable one.

H. Bright Dornblaser, M.D.,
Secretary.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

- Cutter Laboratory
  - Oak Pollen Extract-Cutter; Western Ragweed Pollen Extract-Cutter; Western Water Hemp Pollen Extract-Cutter.
- Gane & Ingram, Inc.
  - Ephedrine Hydrochloride.
  - Ephedrine Sulphate.
- Lederle Laboratories, Inc.
  - Diphtheria Toxoid, ten immunization treatment packages.
  - Diphtheria Toxoid, fifteen immunization treatment packages.
  - Tetanus-Gas Gangrene Antitoxin (Lederle).
  - Gas Gangrene Antitoxin (Polyvalent) Refined and Concentrated without Tetanus Antitoxin (Lederle).
- Mead Johnson & Co.
  - Mead's 10 D Cod Liver Oil with Viosterol.
- National Drug Co.
  - Diphtheria Toxin-Antitoxin Mixture (Diphtheria Prophylactic), one hundred and fifty 1 c.c. vial packages.
  - Diphtheria Toxoid, immunization treatment packages: five (three dose); fifty (three dose); one, five, ten, fifteen, fifty (two dose).
  - Schick Test.
  - Schick Test Control.
  - Tuberculin Old (Human).
- Parke, Davis & Co.
  - Parke, Davis & Co.'s Viosterol in Oil, 250 D.
  - Parke-Davis Cod-Liver Oil with Viosterol, 10 D.
- Winthrop Chemical Co., Inc.
  - Winthrop Viosterol in Oil, 250 D.

A. M. A., October 18, 1930, p. 1179.)

The following articles have been exempted and included with the List of Exempted Medicinal Articles (New and Non-official Remedies, 1930, p. 477):

- E. R. Squibb & Sons
  - Tablets Digitalis Leaves-Squibb 1 Cat Unit (approximately 1½ grains)
  - Tablets Digitalis-Squibb 1 Grain (10 minims U. S. P. tincture)

TRUTH ABOUT MEDICINES

Gas-Gangrene Antitoxin (Combined) Refined and Concentrated-P. D. & Co.—An antitoxic serum prepared from the toxins of *B. perfringens (B. welchii)* and vibrion septique. The quantity of the finished product in the marketed syringes contains 100 units of each antitoxin. It is proposed for therapeutic use against gas-gangrene infection caused by *B. perfringens* and vibrion septique. It is marketed in syringes containing 100 units of perfringens antitoxin and 100 units of vibrion septique antitoxin. Parke, Davis & Co., Detroit.

Inhalant Chloretone, Creosote and Eucalyptol-Sorensen.—It contains chloretone (New and Non-official Remedies, 1930, p. 115) 1.2 Gm. (20 grains); creosote, 2.5 c.c. (40 minims); eucalyptol, 3.75 c.c. (60 minims); alcohol to make 30 c.c. (1 fluid ounce). C. M. Sorensen Co., Inc., Long Island City, N. Y.

Soluble Gelatin Capsules Parke, Davis & Company's Standardized Cod Liver Oil, 10 minims.—Each capsule contains 10 minims of Parke, Davis & Company's Standardized Cod Liver Oil (New and Non-official Remedies, 1930, p. 256). Parke, Davis & Co., Detroit.

Soluble Gelatin Capsules Parke, Davis & Company's Standardized Cod Liver Oil, 20 minims.—Each capsule contains 20 minims of Parke, Davis & Company's Standardized Cod Liver Oil (New and Non-official Remedies, 1930, p. 256). Parke, Davis & Co., Detroit.

Soluble Gelatin Capsules Parke, Davis & Company's Standardized Cod Liver Oil, 2.5 Gm.—Each capsule contains 2.5 Gm. Parke, Davis & Company's Standardized Cod Liver Oil (New and Non-official Remedies, 1930, p. 256). Parke, Davis & Co., Detroit.

Soluble Gelatin Capsules Parke, Davis & Company's Standardized Cod Liver Oil, 5 Gm.—Each capsule contains 5 Gm. of Parke, Davis & Company's Standardized Cod Liver Oil (New and Non-official Remedies, 1930, p. 256). Parke, Davis & Co., Detroit. (Jour. A. M. A., September 6, 1930, p. 729.)

Quinine Bismuth Iodide.—A substance of variable composition containing between 18 and 20.1 per cent of bismuth, between 48.7 and 53.5 per cent iodine; and quinine. Quinine bismuth iodide is proposed as a means of obtaining the systemic effects of bismuth in the treatment of syphilis.

Sodium Potassium Bismuthyl Tartrate.—A basic sodium potassium bismuth tartrate containing from 40.75 to 41.25 per cent of bismuth. It is proposed as a means of obtaining the systemic effects of bismuth in the treatment of syphilis.

Tartro-Quiniobine.—A suspension of quinine bismuth iodide and sodium potassium bismuthyl tartrate in olive oil, each c.c. containing quinine bismuth iodide, 0.072 Gm., sodium potassium bismuthyl tartrate, 0.032 Gm., and camphor, 0.003 Gm. It is proposed as a means of obtaining the systemic effects of bismuth in the treatment of syphilis. It is designed to secure both early action through the presence of water-soluble sodium potassium bismuthyl tartrate, and prolonged action through the insoluble quinine bismuth iodide. It is supplied in 2 c.c. ampules. Spicer & Co., Glendale, Calif. (Jour. A. M. A., September 13, 1930, p. 797.)

Old Tuberculin, Human Strain, Concentrated (New and Non-official Remedies, 1930, p. 360).—This product is also marketed in packages of two vials, one containing a stated amount of tuberculin and the other sufficient diluent to make six dilutions. Eli Lilly & Co., Indianapolis.

Chiniofon-Searle.—A brand of chiniofon-N. N. R. (New and Non-official Remedies, 1930, p. 120). It is also marketed in the form of 0.25 Gm. (4 grains) tablets. G. D. Searle & Co., Inc., Chicago. (Jour. A. M. A., September 20, 1930, p. 865.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg.
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

CAUSE AND TREATMENT OF SOME FRONTAL HEADACHES WITH REPORT OF CASES. Dr. Louis Weiss, Newark (Laryngoscope, Vol. XL, No. 12, December, 1930). The author in this paper discusses the history, etiology and treatment of frontal headaches. He reports thirteen cases, along with diagrams illustrating the deformities of the nose causing frontal headaches. He states that in most cases the patients came to his office thinking that they needed a refraction. In practically all of his thirteen cases, however, their refractive error was found to be practically nil, and the headaches were due to some nasal deformity or pathology. He states that nasal obstruction is usually the cause of frontal headaches. As a consequence of these nasal obstructions there may be present a single or multiple sinusitis. Chronic or acute frontal headaches may be due to nasal obstructions alone or in conjunction with sinusitis. Nasal obstructions are usually the primary cause and sinusitis the accompanying or secondary cause.

The proper method of treatment is to remove the nasal obstruction first. The author believes intranasal surgery should be performed as early as possible to prevent nasal deformities; that nasal surgery does not usually mean the obliteration of the nasal contents but a rebuilding of the nasal passages to effect normal breathing; that an objection may be registered to insufficient nasal surgery which leaves the patient with the same symptoms as before.

The paper next deals with the treatment of acute sinusitis.

Thirteen cases of frontal headaches associated with nasal obstruction are reported. It is interesting to note that in all of these thirteen cases reported the patients came in complaining of frontal headaches due to what they thought was a refractive error. The subsequent examination, as illustrated by the diagrams accompanying this paper, revealed that nasal obstruction was the cause of the headaches. The proper surgical treatment in these cases resulted in complete relief of the symptoms.

L. G. C.

CHRONIC SUPPURATIVE OTITIS MEDIA. Gorge E. Shambaugh, M.D., Chicago, Ill. (Arch. of Otolaryng., Volume 12, No. 6, December, 1930). This article has a decidedly conservative flavor; the author stresses the fact that the really difficult problem is to differentiate between those cases which may flare into intracranial complications, and the much larger majority of harmless cases.

This can only be accomplished by the highly trained otologist who gives more emphasis to diagnosis in his practice than to mere operative technic.

For the serious case which may develop intracranial complications no necessary surgery is too radical to be undertaken. These are the cases of course where there is deep caries or cholesteatoma of the temporal bone. A very foul odor to the discharge, after careful cleansing has been carried out, is indicative of caries or cholesteatoma. So also the location of the perforation in the drum membrane is of importance. Central perforations are usually indicative of a less serious infection. Marginal perforations usually denote bony caries. The size of the perforation is of no particular importance. This is true also of the quantity of the discharge. Usually, when the discharge is mucoid in character and not too offensive, the pathology is confined to the lining mucosa only.

Radical operation is undertaken solely to eradicate the dangerous focus of infection and not simply to arrest the discharge, which, in fact, many times continues after the operation. Hearing is frequently decreased or abolished after healing is complete. Every case should have a fair trial with conservative methods. This consists of simple cleanliness. Debris and granulations must be removed from the fundus of the canal. Dry wipe is favored, followed by a boric alcohol treatment and possibly the insufflation of dry boric acid powder. Dry wicks in the canal are not favored by the author, who believes that as much can be accomplished by the above simple method as can by any or all of the myriads of methods suggested.

M. W. W.

GYNECOLOGY AND OBSTETRICS

INTRATHORACIC NEW GROWTHS: Stuart W. Harrington (Surg., Gynec. & Obstet., Nov., 1930, p. 647). The author reviews the results of surgical treatment in twenty-four cases. He believes the recent increase in frequency is due to better methods of diagnosis, namely the roentgen ray, rather than to an actual increase. Sarcoma, malignant lymphoma and endothelioma have yielded to *x*-ray and radium treatment. Adenocarcinoma has not.

Pain, dyspnea and cough were among the chief symptoms. Horner's syndrome was found in three cases. Dyspnea and cough were marked in anterior mediastinal tumors. Vascular changes, not common, were found with tumors of the upper chest and anterior mediastinum.

Of diagnostic methods the general physical examination is of greatest importance. *X*-ray is the most important single method of diagnosis. Preliminary artificial pneumothorax greatly facilitates *x*-ray studies by distinguishing intrapulmonary and extrapulmonary lesions on the one hand and adherence of the lung to an extrinsic lesion on the other. Fluoroscopic examination aids in ruling out expansile aneurysms and substernal goiters which elevate on swallowing. Bronchoscopic examination helps by ruling out primary intrabronchial disease. Injection of the bronchial tree with 40 per cent iodized poppy seed oil is valuable. Exploratory thoracotomy is also resorted to in diagnosis. Pulmonary collapse, one of the associated dangers, is obviated by use of differential air pressure during the operation.

The operative risk is diminished by establishment of preliminary artificial pneumothorax for a few days before operation to allow the patient to become accustomed to unilateral partial collapse and decreased vital capacity. The author says he prefers to operate with intratracheal anesthesia (ethylene and ether) under positive pressure because one never knows when he may accidentally produce a bilateral pneumothorax in these operations. Besides, it is important to fully expand the lung every three to five minutes during the operation in order to ventilate and reestablish circulation. If the tumor is attached to the thoracic wall or springs from the latter, the operative approach is made over the site of the tumor; if the tumor is in the anterior or posterior mediastinum or in the lung, a postero-lateral transpleural thoracotomy is performed. The extrapleural approach is usually unsatisfactory because of the extensive dissection of the pleura off the tumor which is required. Eventual perforation of the pleura with open pneumothorax is very likely. Marked pleural effusion because of the extensive trauma to the pleura is common. Preferably the operation should be done in one stage. The author had only two operative deaths in his series of twenty-four operated cases. The blood pressure is watched closely and saline with glucose given when the blood pressure falls 10 of Hg., and a blood transfusion when it drops 20 to 30.

The most significant immediate complication is dyspnea with cyanosis. Immediate use of the oxygen chamber is frequently a life saving measure. Later complications are pleural effusion and empyema, notably in cases of teratoma. All patients with these complications in the author's series recovered.

Twelve (50 per cent) of the twenty-four cases of the author's series were benign tumors. However, most intrathoracic tumors are potentially malignant. Eleven patients of this series are living five to forty-one months after operation and all are believed to be completely cured.

The most common tumors of the anterior mediastinum are the dermoids and teratomas. These are usually cystic and, of all the benign tumors, most prone to malignant degeneration. Neurofibromata in the author's series were always in the posterior mediastinum.

Histologically the benign tumors in the author's series were neurofibroma, cellular fibroma, teratoma (dermoid), osteochondroma and fibromyxochondroma. The malignant tumors were osteofibrosarcoma, fibromyosarcoma, fibrosarcoma, fibro-osteochondroma, sarcoma, osteogenic sarcoma, malignant endothelioma, adenocarcinoma, and squamous cell epithelioma (dermoid).

Harold J. Dvorak.

MEDICINE

TUBERCULOSIS ABSTRACTS*

The seventh conference of the International Union against Tuberculosis was held in August, 1930, in Oslo, Norway. Representatives from almost every nation attended the meeting. Three main topics were discussed: "BCG Vaccination," led by Professor Calmette of Paris, "Thoracoplasty," opened by Professor P. Bull of Oslo, and "The Teaching of Tuberculosis to Students and Doctors," reported by Professor His of Berlin. Excerpts of the discussions which follow are derived from the Quarterly Bulletin of the Union, Vol. VIII, No. 4.

PREVENTIVE VACCINATION AGAINST TUBERCULOSIS BY MEANS OF BCG

Professor Calmette summarized the status of BCG. He defined immunity as a peculiar state of resistance to reinfections, depending on the presence of a few specific bacilli or a benign, non-progressive tuberculous lesion. Attempts to obtain immunity by killed bacilli have consistently failed. BCG is a strain of living tubercle bacilli, the characteristics of which are hereditarily fixed. When injected into the body, it produces tuberculins and exerts antigenic functions. It has lost

---

*Reprinted from *Tuberculosis Abstracts,* a review for physicians published monthly by the National Tuberculosis Association, March, 1931, Vol. V, No. 3.

all capacity to give rise to progressive tuberculous lesions.

Immunization can take place at any age, provided the individual is free of any bacillary contamination and reacts negatively to tuberculin. Allergic individuals derive no benefit from BCG. Newborn infants of tuberculous families should be inoculated promptly before they have come in touch with virulent bacilli. The culture may be given hypodermically or by mouth. To be successful, vaccination by mouth must occur within ten days following birth, as during this time the intestinal mucosa consists only of protoplasmic cells, and the living elements of BCG are then easily absorbed and scattered in the infant's lymphatic system.

Since 1924, BCG vaccination has been practiced in seven European, and four South American, countries and has been given a trial in many other countries. Vaccination has no harmful influence; the general morbidity and mortality are less among vaccinated children than among unvaccinated, and the tuberculosis death rate among vaccinated children living in tuberculous families is almost nil. Vaccinated infants must, however, be protected for approximately one month after birth, either by isolating the children from the source of infection or by educating those who care for them. Calmette claims that the objections which have been raised against BCG could not be maintained and that the vaccine should be generally applied.

Several delegates reported the results of their experiments with BCG, which deviated but slightly from those of Calmette. Agreement was, however, not unanimous. Among those who disagreed with Calmette are the following:

E. A. Watson of Canada found in his experiments on animals that BCG has not been entirely deprived of virulence. He had also restored virulence to three strains of BCG as the result of inoculation in serial passages. Dr. Kethner of Germany did not admit the proof that BCG is a fixed virus. Professor Lowenstein of Austria thought that vaccination with living bacilli was a delusion. Professor Morelli of Italy attributed the good results obtained through BCG vacciantion to the prophylactic measures which were carried out simultaneously.

THORACOPLASTY IN THE TREATMENT OF TUBERCULOSIS

Professor P. Bull described his personal operative technic and the results obtained by him and his colleagues, on which he bases these conclusions:

Patients with unilateral or practical unilateral pulmonary tuberculosis, in whom an artificial pneumothorax cannot be induced or does not yield the desired results, may be cured by a complete or partial extrapleural thoracoplasty alone or in combination with a pneumothorax or exairesis of the phrenic nerve.

The operation must be undertaken only after consultation with the physician in charge of the case when he has, after a considerable observation period, been able to form a definite opinion on the prognosis of the case.

The other lung must show no clinical signs or, if they exist, they must be slight and stationary.

The extrapleural thoracoplasty is carried out through a paravertebral incision, with resection of the ribs, from the eleventh or tenth to the first, inclusive.

The resection of the ribs must be undertaken as far back as possible, right up to the transverse processes of the vertebræ.

The two-stage operation gives a lower mortality than the one-stage operation.

The operation does not entail any appreciable permanent discomfort.

The choice between a local and a general anesthetic does not seem to affect the results appreciably.

A thoracoplasty is indicated when improvement has not followed three or four months' sanatorium treatment, and an artificial pneumothorax cannot be induced with success.

Recurrent hemoptyses constitute an additional indication for operation.

Cavities as large as, or larger than, a walnut heal more rapidly and surely after an operation than under expectant treatment.

If a cavity does not collapse completely after a thoracoplasty, it may be made to do so by a pneumolysis and the employment of a fat graft or a paraffin filling, plugging with tampons, or even drainage.

The chronic productive forms of pulmonary tuberculosis are those best suited for a thoracoplasty. It is most dangerous to touch the purely exudative forms.

From 35 to 45 per cent of the patients who cannot be saved by other means may be so by a thoracoplasty, becoming to all intents and purposes fully fit for work.

Some 20 per cent benefit from the operation, but ultimately die of tuberculosis.

Some 6 per cent become worse after the operation.

Some 10 per cent die from operation; *i.e.,* within eight weeks of it.

All sanatorium physicians and general practitioners should know the indications for, and the results of, extrapleural thoracoplasties. No one has any longer the right to withhold from patients suitable for this operation the chances it gives them.

THE TEACHING OF TUBERCULOSIS TO STUDENTS AND DOCTORS

Professor His had questioned all civilized countries relative to the teaching of tuberculosis. Replies to this inquiry constitute the basis of the report and justify the following conclusions:

The teaching of tuberculosis must be given within the compass of the clinical teaching of internal medicine, children's diseases, surgery and dermatology.

These clinics must consequently admit a certain number of tuberculous patients in all stages of the disease and maintain, if necessary, a connection with tuberculosis departments in other hospitals, sanatoria, and dispensaries. Students must be given an opportunity to visit sanatoria and dispensaries.

Special courses and opportunities for practical work on tuberculosis should be made available, but they need not be compulsory.

Postgraduate courses for doctors on the pathology, diagnosis, treatment and prophylaxis of tuberculosis must be organized in such a way that every practitioner may get an opportunity, at certain intervals, to bring his knowledge up to date.

Moreover, it is highly desirable that complete courses be organized on tuberculosis as a whole, or on certain specified problems.

A doctor who wishes to improve his knowledge of this subject ought to be given an opportunity to make a practical study visit to a sanatorium or a dispensary.

Medical officers need a thorough training and postgraduate knowledge in this field of medicine.

Attendance at national and international conferences ought to be encouraged by public authorities.

Dr. Willard B. Soper of the United States, one of those who took part in the discussion, remarked that "instruction in the different medical schools shows great differences, which can almost always be ascribed to the presence or absence of one or more individuals on the teaching staff who are vitally interested in this disease, men with whom the study of tuberculosis has become a passion and who find their greatest satisfaction not only in adding to their sum of knowledge but also in imparting it to others."

He described the postgraduate course given at the Trudeau School of Tuberculosis at Saranac Lake, which he regarded as a great influence in raising the standard of knowledge of tuberculosis in America.

PEDIATRICS

FEEDING CONVALESCENT CASES OF COLITIS: Mather Marvin McCord, M.D., Rome, Georgia (Arch. of Ped., Vol. XLVII, No. 11, November, 1930). The lack of proper refrigeration for the care of liquid milk causes much of the summer bowel trouble with infants.

More babies die from starvation during convalescence than during the acute stage of colitis.

Dried milk of the 12 per cent variety furnishes just enough of digestible fats to aid in making a normal soap stool in the child's bowel without throwing a burden on it by feeding milk too high in fats. When the soap stool is formed the food acts as an astringent in the bowel. When this action takes place there is no need for drug astringents.

Dried milk is safer, more easily digested, and more dependable than liquid milk in hot weather. If properly used it will hasten recovery following attacks of colitis.

R. N. Andrews, M.D.

ALIMENTARY ANEMIA: Wm. Willis Anderson, M.D., Atlanta, Georgia (Arch. of Ped., November, 1903, Vol. XLVII, No. 11). Alimentary anemia as an entity was first described by Czerny in 1912. Kleinschmidt, in 1916, gave a more detailed report of this condition.

The majority of cases of alimentary anemia occur between the ages of three months and two and a half years. Not only is the spleen enlarged in many cases, but the tonsils are also hyperplastic.

Most of the children with alimentary anemia give a history of having existed almost altogether on a milk diet, whether it be breast milk or cow's milk. Large quantities of milk not only fail to benefit this type of anemia, but, taken without a balanced ration, will cause the anemia to become more severe.

Alimentary anemia may be divided into two groups: one group of children showing malnutrition, while the other group appears plump and are hearty eaters. These children may be of average weight or even a little overweight. In both groups the blood findings are identical. There is, more or less, a marked reduction of the hemoglobin. The red cells may be reduced in number or be of an average count. The white cells are usually slightly increased.

As a rule, if the hemoglobin is below 50 per cent it is wise to give human blood, preferably by transfusions. The amount of milk is reduced to a pint or a pint and a half a day, and a more liberal diet prescribed. Iron in some form is usually efficacious, whether it is simple reduced iron, syrup iodide of iron, or ferri carbonas saccharatus.

Although the author believes there is a definite type of anemia which is largely concerned with diet, hygiene, a reserve store of iron in the liver and general bodily development, he feels there are numrous phases in the condition as yet unexplained.

R. N. Andrews, M.D.

DIPHTHERIA OF THE UMBILICUS: J. S. Montgomery, M.D., Detroit (Amer. Jour. of Dis. of Children, Nov., 1930, Vol. 40, No. 5). Diphtheria of the umbilicus is a disease that is seldom recognized clinically. These cases could be divided into three classes: (1) those showing no clinical evidence of infection, but only positive cultures from a somewhat moist umbilicus, (2) those showing only a slight caseous deposit with positive cultures, and (3) those with more extensive evidence of infection.

Comby points out that diphtheritic infection of the umbilicus does not differ greatly from non-specific infections of the same region, and urges that bacteriologic examination be resorted to more frequently. He also points out that the disease is rarely febrile, and that the infant may continue to nurse and to gain weight, the majority of these patients having gained weight while in the hospital.

R. N. Andrews, M.D.

ACUTE HEMOLYTIC ANEMIA IN CHILDHOOD: Sylvan D. Lazarus, M.D., Brooklyn (Amer. Jour. Dis. of Children, Nov., 1930, Vol. 40, No. 5). In 1925, Lederer first called attention to a form of acute, rapidly progressive anemia, accompanied by fever, general weakness, marked pallor and splenic and hepatic enlargement, with severe leukocytosis and erythroblastemia. Another striking characteristic of the picture was the rapid, permanent recovery to normal, following a transfusion of whole blood. The recovery not only demonstrated itself clinically by the general improvement of the patient, but also in the return of a normal hematologic picture.

In reviewing the literature of pediatrics, one finds no direct reference to this entity, although these cases are probably seen and described as acute atypical anemias. Clinically, the picture is so alarming, rapid and severe, that it indelibly impresses one, and the dyspneic breathing and air hunger especially simulate the picture of severe poisoning.

The marked progressive anemia, the general tenderness of the body, the fever, the increased pulse and respiration rates, the suggestive abdominal symptoms, such as vomiting and the tenderness of the abdomen accompanied by splenic and hepatic enlargement, are the cardinal symptoms. The initial blood picture before transfusion is suggestive of severe leukanemia.

The most striking feature of this entire condition is the rapid recovery, judged by clinical symptoms and improvement of the blood picture, following transfusion of whole blood. All the cellular elements of the blood rapidly assumed a normal picture and the abnormal elements, such as nucleated red cells and megaloblasts, disappeared. No icterus was noted in these cases.

Etiologically, nothing has been found as a specific cause, although an infectious origin has been suggested by some authors. Subsequent infections do not cause a return of the syndrome.

R. N. Andrews, M.D.

SURGERY

UBER DIE RESULTATE DER OPERATIVEN BEHANDLUNG DER GRAWITZTUMOREN. E. Ljunggren (Zeitschrift fur Urologie, 1930, 24:883-894). A report of fifty-eight epithelial neoplasms of the kidney, three of which are classified as adenomata. All were treated by nephrectomy. There were six operative deaths (10.3 per cent).

The author calls attention to several important questions in determining the suitability of a case for operation. For example, nephrectomy was done in two cases with demonstrable pulmonary metastases. The first was symptom-free and gained weight for twelve months, but died twenty months after operation. The second was symptom-free four years after operation, the pulmonary lesions having remained stationary. He refers to the case of Bumpus, whose patient was living and well, his pulmonary metastases having disappeared two and one-half years after operation.

Thirty-nine of the fifty-eight cases had a thrombus of tumor tissue in the renal vein as verified by microscopic examination. Six died from operation. Twenty-six per cent were well five years or more after operation. In four cases it was known that tumor tissue was left in the vein. One of these died of other causes five years and eleven months later, and at autopsy no trace of tumor tissue could be found. The author feels that spontaneous necrosis of the remaining fragment must have occurred and cites the literature to the effect that this is not so uncommon as might be supposed.

Of the fifty-two patients who survived operation, twenty-five died with recurrence, six of these surviving for from five to eleven years, four died of other causes, ten months to thirteen years after operation, while twenty-one were free from recurrence from one to ten years, fourteen being alive more than six and ten more than ten years. Counting the patient who lived thirteen years and died of other causes, there were 19 per cent of ten year cures, while 45.8 per cent of the cases operated upon ten or more years ago survived the ten year period.

The author points out that it is unsafe to speak of cures of shorter duration than ten years, since the literature contained many instances of death from recurrence after that interval.

The paper represents a careful study of the end-results of operation for "hypernephroma" and makes it clear that operation is not contraindicated by the presence of pulmonary metastases, nor the prognosis made completely hopeless by invasion of the renal vein. The number of ten year cures is remarkably high and most encouraging.

Donald C. Creevy, M.D.

MIXED TUMORS OF THE KIDNEY IN INFANCY AND CHILDHOOD. H. L. Kretschmer and W. G. Hibbs (Surg., Gynec. & Obstet., January, 1931, Vol. 52, pp. 1-24). The authors report seventeen cases of malignant tumors of the kidney occurring in infants and children. The study brought out the interesting fact that in many instances the true nature of the tumor was not recognized either at the time of operation or at the time histological examination was made. Theories of pathogenesis are discussed.

The involved kidney is globular to oval in shape, solid, opaque, subdivided into lobules and somewhere on the surface a nodule of kidney tissue usually remains. In this series the kidneys weighed from 235 to 1,530 grams. Microscopically there is myxomatous tissue in which gland or duct-like figures are imbedded. Striated and unstriated muscle fibers are other elements seen. Necrosis of the tumor is often marked. Extension and metastasis of these tumors is exceptional unless the original tumor is large.

Clinical features reported are as follows: Sex, 14 males, 3 females; age, 3 months to 6.5 years; side involved, left 10, right 5, bilateral 2. Palpable tumor was the predominating symptom. Fever occurred in nine patients; pain in the abdomen in six. Only one had urinary frequency. Gross blood in the urine is rarely present. In every case there was a secondary anemia.

The authors emphasize the need of cystoscopic and pyelogram studies in making a diagnosis. Prognosis is bad, as sixteen of the seventeen patients died. Case reports reveal that both surgery and deep *x*-ray therapy were employed in the treatmnt of these patients, but the authors do not make any recommendations regarding treatment.

Herbert A. Carlson, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Microbiology and Elementary Pathology. Charles G. Sinclair, B.S., M.D. 362 pages. Illus. Price $2.50. Philadelphia: F. A. Davis Company, 1931.

Practical Treatise on Diseases of the Digestive System (Vols. I and II). L. Winfield Kohn, M.D., F.A.C.P. 1125 pages. Illus. Price 2 Volumes, $12.00. Philadelphia: F. A. Davis Company, 1930.

The Measurement of Man. J. A. Harris, C. M. Jackson, D. G. Paterson, R. E. Scammon. 215 pages. Illus. Minneapolis: University of Minnesota Press, 1930.

Physical Diagnosis. Warren P. Elmer, B.S., M.D., and W. D. Rose, M.D. 903 pages. Illus. Price, $10.00. Saint Louis: The C. V. Mosby Company, 1930.

A Manual of Normal Physical Signs (Second Edition). Wyndham B. Blanton, B.A., M.A., M.D. 246 pages. Illus. Price, $3.00. Saint Louis. The C. V. Mosby Company, 1930.

Medical Jurisprudence (A Statement of the Law of Forensic Medicine). Elmer D. Brothers, B.S., LL.B. 309 pages. Price, $3.50. Saint Louis: The C. V. Mosby Company, 1930.

Intestinal Toxemia (Autointoxication) Biologically Considered. Anthony Bassler, M.D., F.A.C.P. 433 pages. Illus. Philadelphia: F. A. Davis Company, 1930.

Proceedings of the Twenty-fourth Annual Convention of the Association of Life Insurance Presidents. 280 pages. Illus. 1930.

Certified Milk Conferences Held in 1930. Proceedings of A. A. M. M. C., C. M. P. A. A. and M. C. M. P. 354 pages. Illus. Detroit: Certified Milk Producers' Association of America, 1930.

NERVOUS INDIGESTION—Walter C. Alvarez, M.D., Associate Professor of Medicine, University of Minnesota (The Mayo Foundation). 297 pages. Price, $3.75. New York: Paul B. Hoeber, Inc., 1930.

In this beautifully written and entertaining little book, we have a discussion of that most common and most neglected of disorders, so-called nervous indigestion.

As we grow older, we almost all appreciate the fact that patients of the "nervous" type do not lend themselves to teaching purposes, so we see little of them in school. The pictures they present are not definite and even if they are presented to us, we disregard them in favor of the definite pathology of ulcer, gall stones and the others. But whether we admit it or not, we all treat patients with functional disorders with more or less functional methods.

"Nervous Indigestion" is, however, not simply a serious discussion of this most important theme, but its sidelights on human nature are so amusing that one is loath to put the book aside until it has been completely read.

H. B. Sweetser, Jr., M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

FOR SALE—Because of illness a small hospital and practice are for sale at great reduction in town of 800 inhabitants, prosperous community, German or Scandinavian physician preferred. Half cash, balance terms. Address D-121, care Minnesota Medicine.

FOR SALE—Instruments and office equipment of the late Dr. A. E. Comstock. See or address Dr. C. F. McNevin, 714 Lowry Building, Saint Paul, Minnesota.

FOR SALE—1 Standard Type "D" X-Ray apparatus 100 P.V.K. with auto-transformer and Rheostat control. Perfect condition. Also new Coolidge tube. Address D-123, care Minnesota Medicine.

WANTED—Capable man licensed in Minnesota to take charge of established eye, ear, nose, and throat practice. Must be able to do refractions. Address D-122, care Minnesota Medicine.

GOOD OPENING—For physician in Northome, Minnesota. Surrounding country is good and covers a big territory. Address H. Brunelle, Northome, Minnesota.

PHYSICIAN'S OFFICE FOR RENT—Best location Midway district, corner Thomas and Hamline, Saint Paul. Rent $25.00 a month. Inquire at dentist's office.

MEDICAL BOOKS
of any author or publisher
ARTHUR W. ISCA
210 So. 7th St.
Elks Building Minneapolis
The only exclusively medical bookstore in the N. W.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XIV APRIL, 1931 No. 4

AORTIC STENOSIS WITH CALCAREOUS NODULES IN THE AORTIC VALVES*

E. L. Tuohy, B.A., M.D., F.A.C.P., and P. F. Eckman, B.A., M.D.
Duluth

Sir Dominic John Corrigan[1] first directed interpretation of aortic disease along an intelligent correlation of etiology, pathological sequences and physiological effects. Few great medical scientists have ever had as much acclaim in their own lifetime or retained it so well in the century which has followed.

From the standpoint of etiology it is illuminating to observe that medical science gained little actual working knowledge of syphilitic aortic disease passing from the period before to that after Schaudinn.[2] Dark field studies gave early diagnostic criteria of syphilis, but nothing new pertaining to mesaortitis or separated aortic valve cusps. In a decade when the other great agency inducing aortic disease—rheumatic fever—is discussed by such a host of the world's acute bacteriologists, and with such varying discordant impressions, it may hearten us to speculate that discovery of a specific agent causing rheumatic fever and its congenera† may give us more scientific than practical satisfaction.

Following the Virchow epoch, the heart and aorta came into the most exacting evaluation of anatomical form and pathological imprint. The roentgenology of today (after Kreusfuchs, Assman and others) has given us the most direct and accurate clinical confirmation in the living for what had previously been so dogmatically outlined by Continental necropsists. Outlines have come into their own, and the clinician's consciousness comes to be more aroused by his eyes than by his ears. Lest, however, we be unfair to Harvey and Laennec, let us hasten to add that English and Dutch clinicians and physiologists (Mackenzie 1853-1925, Einthoven 1860-1927, Lewis 1881- , and their school) with consummate disregard for Teutonic mensuration of diameters and weights, introduced a flood of information about how hearts worked and aortas withstood, rather than how they looked on pathological specimen trays. There still remains the constant need for a harmonizing of the data accruing from the various methods of approach; none up to date has yielded all the information or all the facts. The American Heart Society well exposes our present dilemma in urging clinicians to utilize an involved technical schema of diagnosis and classification—etiological, anatomical and physiological. The end is not yet: the stage is now set for biochemical and biophysical investigations bearing upon general metabolism; the cardiologist concentrates for the moment upon entities as disastrous as angina pectoris or far reaching as calcium deposition in blood vessel walls. In both there is a fundamental oxygen and nutrient deficiency, and seemingly a chance emplacement determines whether the resultant death shall be immediately of the body as a whole or gradually through loss of dispensable parts. The prolongation of life expectancy is focusing attention upon factors (metabolic, endocrine, hereditary or unknown) other than the well known rheumatic infections and syphilis. Degenerative lesions attributable to senility defy arbitrary rulings as to age: the young man of thirty-eight dies of coronary infarction with only one centimeter of the descending branch of his left coronary involved; the man of eighty-five lives with his aorta and cerebral vessels laid down as if in concrete. In a country or historical period when the average life tenure was twenty to twenty-five (England in Queen Elizabeth's time: portions of India today) aortic diseases would be largely rheumatic and rarely congenital. A period where the tenure stepped up to thirty-six or forty (the United States at the time of the Civil War) would include in addition many syphilitics, with a heavy incidence among the colored race. The conditions of today, with a life expectancy around fifty-eight to sixty, find many living into the eighth decade, and a busy practitioner is confronted with a major problem of aortic disease and heart failure in hypertensives and arteriosclerotics, where neither rheumatic fever nor syphilis registers high in etiological or statistical columns. The term "cardiovascular disease" is too all-inclusive. Life insurance mortality tables indicate the need for intimate analyses of important subdivisions within this universal conglomerate.

---

*From the Medical Department of the Duluth Clinic, Duluth, Minn.

†The group of what M. J. Rosenau calls "the whole rubric of the septicemias."

Unanimity in the opinion of observers has come in the matter of the lack of causal connection between primary or essential hypertension and syphilis. We know that "arteriosclerosis is only encouraged or somewhat hastened by essential hypertension." Very high grades of atherosclerosis (the senescent type) occur without hypertension. Out of the 70 to 75 per cent of essential hypertensives dying of heart failure fully one-third have coronary disease. Of the coronary group not more than one-third have typical Heberden's anginal attacks. In addition, an increasing number of well authenticated and supported cases are coming to light with typical angina, where the caliber of the coronaries is essentially undisturbed: the extra heart effort in hyperthyroidism and the anoxemia of high grade Addisonian anemia.‡ We propose to add another instance associated with rigid, calcareous nodules, incapacitated aortic cusps, with aortic stenosis. Gradually it is becoming apparent that Allbutt was thinking squarely when he refused to divorce his attention from the aorta and its sigmoid portion in anginal states. The debate over whether coronary or aortic states product angina pectoris is yielding to the certainty of opinion that both can and do produce it. Keefer and Resnik[3] not only reiterated Heberden's dictum that true angina pectoris was a lethal malady, but they directed attention at the same time to the probable reason for sudden death in aortic disease, and to the role played by anoxemia of the heart muscle in anginal attacks. Those who have followed a goodly number of aortic insufficiency cases need not be told of this tendency to sudden death. The anoxemic heart muscle theory, with ventricular fibrillation as the final chapter, backed up by poor diastolic pressure in the aorta, is now much stressed by commentators.

At to the features involved in the antemortem diagnosis of aortic stenosis, further preliminary comment is not amiss. The aversion to the making of a clinical diagnosis of aortic stenosis is an inheritance from overzealous student days, when every basal systolic murmur meant aortic stenosis. Without decrying the art of Auenbrugger (1722-1809)[4] or the thoroughness and foresight of Corvisart (1755-1821)† and the possibilities of percussion in general, it is fair to state that it requires less skill to show up accurate heart outlines teleoroentgenographically than to judge the same without roentgen aid. These better outlines have done much to clarify the diagnosis of single and multiple valve defects where *inspection* can the better augment and safeguard auscultation. It must be granted that rough, sclerotic valves in the aged, and factors of heart rate, thin chest wall, and many others, in the young, produce rough systolic murmurs at the base; but these hearts, independent of hypertension, heart fixation or kidney disease, are not enlarged. In true rheumatic endocarditis isolated aortic involvement must be very rare. Where rheumatic aortic insufficiency is present with stenosis the former is the dominant lesion as expressed physiologically (pulsus celer, widespread flopping mercury level in sphygmomanometer—all signs of extended pulse pressure) and decides the pattern of the heart outline. Independent of syphilis, and likely independent of rheumatic fever, a third agency makes the aortic cusps so rigid and unyielding as to produce the most extreme grades of stenosis.* It does so extremely gradually, and without either signs of heart infection or early congestive failure. Insufficiency of minor grades invariably accompanies it, but it is always in the background and is entirely secondary to the dominant lesion, which is stenosis. This lesion is coming to be known under the name "calcareous nodules" in the aortic valves. The name of Mönckeberg[5]† is often linked up with discussion of calcareous changes in the blood vessels of the extremities, and with a discussion of the pathology of the aortic valves.

---

‡The list is constantly growing: a miscellaneous group now includes paroxysmal tachycardia, anemia with myxedema, arteriovenous aneurysm and others.

†Corvisart, Jean Nicholas. Auenbrugger wrote his thesis upon percussion probably about 1751. Corvisart (physician to Napoleon and Josephine) popularized this epoch-making diagnostic agency, and has gained much in the appreciation of posterity by refusing to credit himself with its rediscovery.

*Pulsus tardus and characteristic polygraphic tracings are not mentioned here. The finding is only confirmatory and the method is becoming obsolete.

Clawson, Bell and Hartzell[6] have very well described the condition which we are reporting. Although their article confines itself to a discussion of the pathological changes found in old valvular defects and has no mention of associated clinical features, those interested should carefully read their description. At a clinic given later by one of the authors (Clawson) he appealed to the clinician to look for these lesions antemortem. This appeal, together with the fact that we have found several such hearts at our regular clinicopathological conference at St. Mary's hospital, caused this possibility to gradually filter through our clinical consciousness, and induced us to venture such a premortem diagnosis. The diagnosis has now been made six times; in three cases we have had autopsy confirmation. In retrospect, we have likely overlooked not a few of these same types. The first impression of well trained internists on introduction to the subject is to classify this lesion as a museum curiosity; to spend an hour equivocating about the cause—grouping it on the one hand as simply an evidence of "an old healed rheumatic valvulitis," or as the result of systemic arteriosclerosis, with special selection of the aortic cusps. Finally, a few deny the clinical existence of the entity because, forsooth, "we have enough etiological and diagnostic confusion without introducing it!" Until something more definite is known concerning the physiochemical conditions behind tissue infiltration with calcium, the manner of "calcareous nodule" deposits in aortic valves is of infinitely less clinical moment than the fact that such a state can silently produce very large hearts, with thick, dilated left ventricles; that the process may begin much earlier than the usual atheromatous sequence develops universally; that it is often seen most typically in those beyond the age where those with multiple rheumatic valve defects are likely to reach; that associated with the syndrome there are no inflammatory reactions evident either in vivo or in the aortic leaflets when examined postmortem; that it can produce a situation at the base of the aorta yielding typical angina, without the characteristic narrowing along the course of the coronaries.

The following case summary is submitted in some detail because it well illustrates these features.

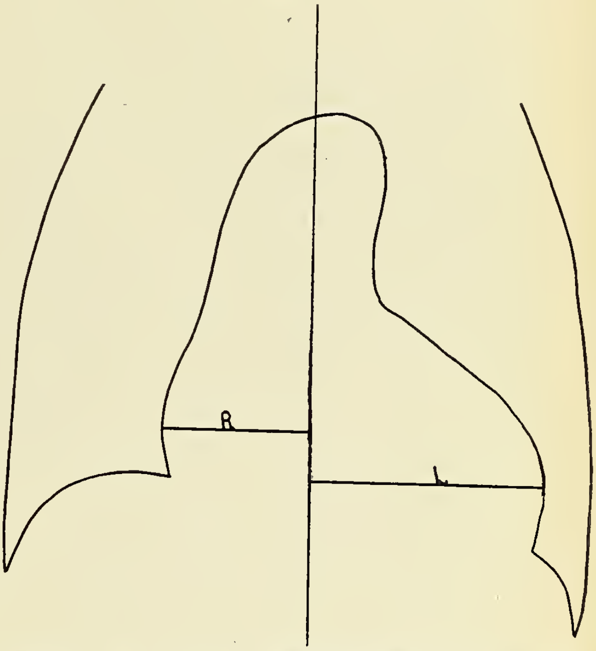


Fig. 1. Case 1. W. H. Teleoroentographic tracing made in December, 1929. Original measurements: right, 7 cm.; left 10 cm.

CASE SUMMARY

Case 1.—W. H., a male, married, aged 37, was first seen February 23, 1919.

Nothing bearing upon later developments came through an analysis of his own family history. His wife had contracted syphilis from her first husband. This knowledge only obscured the issue as to his illness. Three sisters and one brother were living and well.

When young he had had scarlet fever.

In 1913 he had been ill with typhoid fever for about five weeks, but seemed to fully recover. Ten years previously he had had some indigestion, with a marked tendency to "water brash about one hour after eating." There was no suggestion of a rheumatic history or its equivalent.

---

†We have perused his two original articles in Virchow's Archives for Pathological Anatomy and Physiology (the first in 1903, VIII, 171, p. 141, the second in 1904, CLXXVI, 472) with great interest. Mönckeberg's name is most familiar to pathologists in terms of his first article, which emphasized the frequency of media calcification in the extremities in contrast to the intimal changes in important central arteries, chiefly the aorta, the coronaries, and arteries at base of brain. He contends that the processes involved may occur synchronously, but as a rule are distinct and different tendencies. In the second article Mönckeberg stresses the importance of the media in the matter of the calcification of the aortic cusps. He analyzed fully the histological layers comprising the valve cusps, and found a difference between the ventricular surface below and the aortic above, in the latter a preponderance of media-like tissue, with horizontally arranged connective tissue, constituting the main part of the valve and containing few elastic fibers. He states that most people after thirty-five seem to have a thickening of the proximal edge of the aortic valve, leading gradually to palpable and visible yellowish-white areas. The important point is that these begin in the media-like layers. The process continues through fatty degeneration, focal necrosis and chalk deposits, with confluence and distortion. He states that the process may go ultimately to the outer margin of the valve. After the calcareous deposits occur he states that they may cause a deposit of fibrin, which further accentuates the condition and leads to functional valve interference. While the early development obtains only in the aortic component of the valve, later, of course, the other two layers may be distorted, and, as has been stated, these masses can be felt projecting through toward the ventricular side. He finds no relationship between arteriosclerosis, beginning in the aorta, and these lime deposits.

Briefly stated, his immediate complaint was that of indigestion: a discomfort from one to one and one-half hours after meals.

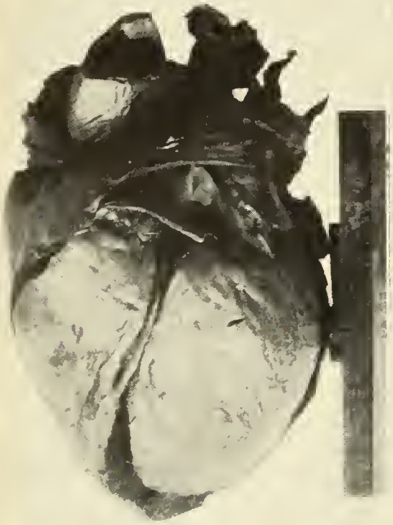


Fig. 2. Case 1. Front view of sectioned heart (1,050 grm. wgt.). Centimeter rule at side.

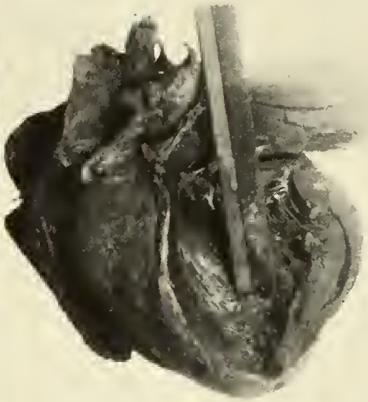


Fig. 3. Case 1. Showing thickness of left ventricular wall.

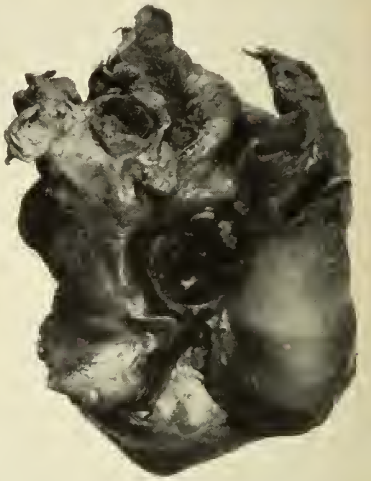


Fig. 4. Case 1. Same heart viewed from above. Aortic cusps too dark to show detail.

The essential findings after a thoroughgoing examination, including roentgen studies of the gastrointestinal tract, were quite negative except for relatively high gastric acids.

He responded very well to the exhibition of alkalies and frequent feedings.

The features pertaining to the findings of his chest examination were of the greatest significance in the terms of succeeding events: There was a rough systolic murmur, heard best at the base and transmitted up into the neck vessels, with a fairly definite diastolic murmur heard just to the left of the sternum in the third interspace. The systolic murmur was widely distributed and could be heard also to some degree in the back.

Several Wassermanns of the blood were taken, and all were negative. In fact, he had a short period of anti-specific treatment based upon the above history of his wife, and the general supposition was that as an aortic diastolic murmur was present and we could not prove that he had had rheumatism, he probably had had syphilis!

Finally, when seen two months later, he was much improved, and he was catalogued as an instance of rheumatic valvular heart disease, with aortic insufficiency and some degree of aortic stenosis. The heart was then only slightly enlarged, the left ventricle showing the major degree thereof.

He reported later that he worked regularly. He had occasional winter colds, but no unusual cough, dyspnea or difficulty until in December, 1928. Although he had to walk only a matter of three blocks, whenever he did so in colder weather or against heavy wind, he experienced pain across the chest, substernal, radiating out toward the left arm. This would disappear if he stopped to rest, but if he persisted it would become a grinding, boring, torturing distress. These attacks occurred only on effort.

Examination at that time showed a regular heart, with a pulse rate of 80. The patient had an excellent appearance; no cyanosis. However, examination over his precordium yielded evidence of a very large heart, with a strong systolic thrill felt over the upper chest, and corresponding with this a very loud, rough murmur heard over the entire chest, and very audible in the back. There was in addition a short diastolic murmur heard at the second aortic space to the right and the third interspace to the left of the sternum. There was, however, no drop in the diastolic pressure; the systolic pressure about 150. The heart outline was globular (Fig. 1). The electro-cardiographic evidence was essentially negative except for inversion of the T-wave in Lead I, a ventricular predominance, and some slight evidence of "arborization defect" or block. It was then obvious that we were dealing (and had been from the beginning) with a very high grade aortic stenosis, with a minimum degree of aortic insufficiency. We had in the meantime been "tuned in" to the possibilities of another etiology. Treatment had no effect in reducing his anginal attacks, but they were never severe except under the influence of effort. Up to March 30, 1930, he had no marked evidence of visceral congestion. However, he soon developed extreme dyspnea, and died characteristically of slowly progressive myocardial exhaustion.

The pre-autopsy diagnosis was "calcareous nodules in the aortic valves, with aortic stenosis, cardiac hypertrophy, chronic visceral congestion with edema." At autopsy the heart was found to weigh 1,050 grams, with extreme hypertrophy and dilatation and thickening of the left ventricular wall. There was a high grade of stenosis of the aortic valves, with a slitlike opening in the middle, yielding a limited degree of aortic insufficiency. There was confirmation of the visceral congestion as calculated. The mitral valves were somewhat thickened but functionally undisturbed. The aortic valve showed extensive calcification, appearing chiefly on the upper surface, but could be felt from underneath. The edges of the valves were densely adherent to each other except a central portion forming an irregular triangular opening, slitlike in character, with rigid edges. When measured, the wall of the left ventricle was 2 cm. in thickness, and that of the right 0.5 cm. (Figs. 2, 3 and 4). The root of the aorta itself showed only moderate yellowish athermatous plaques, and the openings of the coronary ostia were not disturbed. The coronary vessels appeared to be somewhat wider than normal at their openings, and, while showing a few yellowish plaques here and there, were thoroughly patent throughout their larger branches. The myocardium, aside from its increase in bulk, seemed little changed.

COMMENT

Clawson, Bell and Hartzell reported fifteen such cases out of a total of 280 cases of nonsyphilitic valvular heart disease studied. Touching only upon the main incidents in their description, this case is in general conformity with theirs:

1. Marked thickening and stiffening of the aortic valve leaflets due to calcareous nodules within them.
2. The portions of the leaflets between the nodules are of normal thickness and do not show inflammatory hyperplasia.
3. Union and adherence of the edges of the valve leaflets (the most definite feature involved, indicating the possibility of an inflammatory adjunct in the causation).
4. The nodules project and appear on the aortic surface, but are easily felt from the ventricular surface (Fig. 5).
5. The aorta itself, except for about 1 cm. up from the edge of the valve bases, is singularly undisturbed. (Older clinicians maintained that aortic stenosis shields the aorta from systolic shock; hence conversely the tendency to aortic atheroma in young athletes.)
6. The nodular lesions are singularly unlike ordinary intimal atheroma commonly seen within the endocardium and intima of the aorta.
7. Consulting the original article of Mönckeberg it will be seen that this calcification process is one of media degeneration and invasion. The etiological and determinative factors are, as yet, speculative. It is different from and independent of ordinary (intimal) atherosclerosis.
8. If death does not supervene from other causes the process can result in extreme degrees of aortic stenosis with enormous hearts.

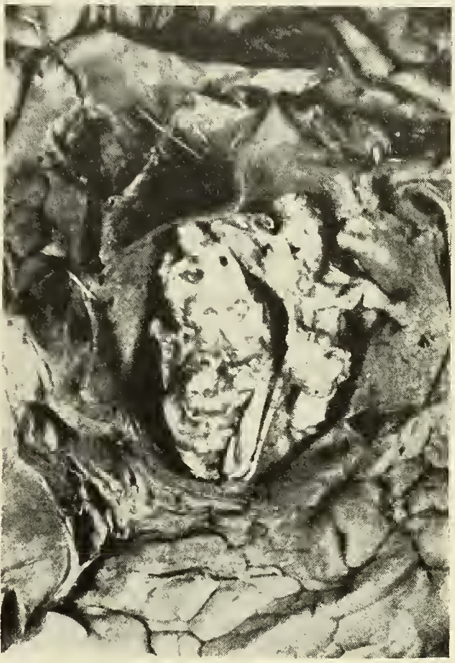


Fig. 5. Cut taken from reprint of article by Clawson, Bell and Hartzell, because it shows so clearly the confluent calcareous nodules in one of their cases. (Amer. Jour. Path., Vol. II, Plate 40, No. 30. Valvular Diseases of the Heart.)

Case 2.—Since the heart found in this forty-nine-year-old man has been found exactly copied in two other autopsies, all descriptive and analytical detail will be much condensed.

J. H. G., a male, aged 44, was observed between the dates November 29, 1924, and his death, November 26, 1927.

At autopsy he had a 1,100 gram heart, globular in shape, and with colossal left ventricle thickening. The same extreme degree of aortic stenosis was seen, with only a slitlike fissure in the center. Curiously, many attendants who saw him fell upon his obvious "diastolic aortic murmur," and were loath to abandon the possibility (at his age) of syphilis, despite his negative history and many negative Wassermanns.

His blood pressure received a good deal of attention, especially in view of the fact that the diastolic pressure never dropped below 100; the systolic advanced near his demise to about 200. His "precapillary arteries" studied postmortem were not those of primary hypertension.

Clinically, it was the general impression that he had "rheumatic endocarditis with aortic insufficiency and stenosis." Suffice it to say that the autopsy showed some fibrotic areas in the myocardium (he died with increasing cardiac dyspnea and visceral congestion), his aortic intima was smooth, soft, and free of atheroma. There were a few yellowish spots seen on the wall of the traced out coronaries, but their patency was not disturbed. The other valves of the heart were normal.

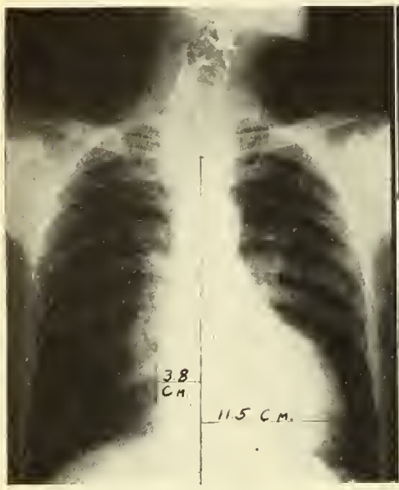


Fig. 6. Case 4. J. V. Chest film, six feet.

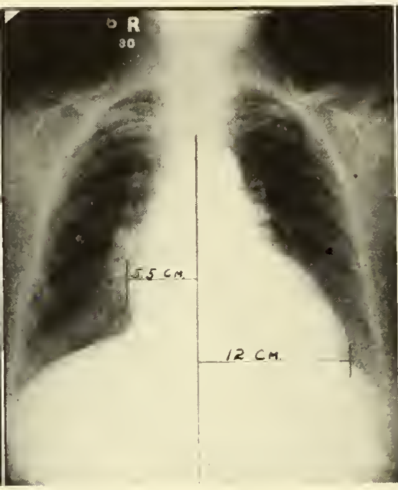


Fig. 7. Case, Mrs. P. W. Six feet, X-ray chest film.

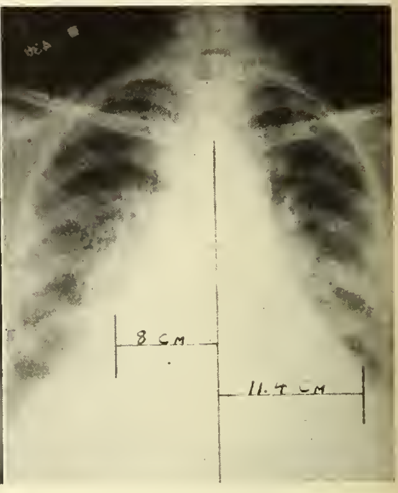


Fig. 8. Case 6. Mrs. A. H. Measurements distorted since film was taken at bedside, short focal distance, and hilus shows abundant evidence of venous congestion.

Case 3.—In contrast to these two men, Mrs. L. St. M., aged 63, came to autopsy with the same type of heart, weighing 650 grams (heavy, indeed, for a woman).

Little is known about her clinical story except that she had had "heart trouble for twenty years." There had been a number of decompensations, and death supervened, with copious spitting of blood, and there were numerous hemorrhagic infarcts.

Here, also, the process was confined entirely to the aortic valves.

We have three other patients under observation upon whom we have made the diagnosis of such aortic valves. It is self-evident that the diagnoses can as yet be largely "impressions," but we feel that with the definite globular heart, with decided left ventricular enlargement; with the rough systolic murmur, and the corresponding thrill‡ at the base transmitted into the neck; a short diastolic murmur in the usual aortic areas of transference, and a high or maintained diastolic pressure; with a history as negative for syphilis and rheumatic infection as we can ever depend upon—we fully expect autopsy confirmation, if such is ever permitted. In all, note that the evidence of aortic insufficiency is definite (a lesion most classically constant with its auscultatory evidence). Further, that the evidence of insufficiency is minimal, while that of aortic stenosis is maximal.

Case 4.—J. V., male, aged 47, was without previous history of specific or non-specific infection. He was seen in October, 1929, with a definite cardiac condition. For eighteen months he had had substernal pain, palpitation and dyspnea on exertion. On occasion there had also been a harsh, non-productive cough.

The chest examination (briefly outlined) is noted on his chart as follows: "Percussion shows a definite left ventricular hypertrophy, without any evident enlargement of the aortic arch. Fluoroscopic inspection brings out the definite globular heart outline, with a maximal left ventricular increase (Fig. 6). Palpation reveals a fine thrill at the third interspace to the right. This thrill is increased after exertion. On auscultation a very rough, grating, blowing systolic murmur is heard best at A2, but is transmitted over the entire precordium and up into the neck. At the third left interspace and at the lower end of the sternum, slightly to the left, there is a fine, short diastolic murmur. At the base this somewhat displaces the second tone. The blood pressures were 150/70. An electrocardiogram showed an inversion of the T-wave in all leads, and some arborization defect (partial block)."

Case 5.—Mrs. T. W., aged 72, the mother of ten children (nine living and well), presented herself first in June, 1930.

She admitted no previous illnesses nor operations; nothing to indicate a rheumatic or luetic infection.

For four years there had been increasing precordial distress, lately becoming more severe and increased on exertion. The two severe spells were epigastric, accompanied by nausea and vomiting, and twice called for hypodermic relief. Invariably, however, the attacks were associated with a choking sensation, coming on with dyspnea and palpitation. Many such attacks came on of late without pain. There was much shortness of breath on exertion.

---

‡It seems these thrills are easily overlooked or their presence minimized. In earlier stages they may not be felt over a very large area. Thus, in our case, the earlier observation entirely omitted any statement as to a thrill. Since this became so all-pervading later it is folly to assume that slight degrees of it had not been overlooked.

A brief summary of the chest findings is hereby abstracted: "Left ventricular enlargement, with the percussion border 12.5 cm. to the left of the midline in the fifth interspace (Fig. 7). On auscultation a slight systolic thrill heard over the precordium and up into the neck, synchronous with a loud, rumbling systolic murmur of like distribution. In the third interspace to the left of the sternal border is a faint, sharp, diastolic murmur. There was normal sinus rhythm. The blood pressures 140/70. There was no edema nor obvious visceral congestion."

A Graham-Cole dye test showed poor filling and sluggish emptying of the gallbladder. The gastrointestinal tract was otherwise roentgenologically negative.

There is a fair presumption here that the heart condition has not accounted for all the distress, particularly the epigastric tenderness and decisive colic. Conversely, the gallbladder condition could not possibly account for the heart outline and the determinative data pertaining to the aortic valves.

Case 6.—Mrs. A. H., aged 62, was seen first in July, 1930. She presented the same negative history as the previous cases. She had been treated previously for a year for heart distress and a tendency to dropsy. Her physician had stressed with her a high systolic blood pressure.

The chest examination again showed the characteristic heart outline (Fig. 8). We found the loud, grating, systolic murmur (heard best at the base and transmitted up into the neck), a soft, short, diastolic murmur heard at the second aortic space to the right and the third interspace to the left of the sternum. There was a totally irregular pulse incidental to auricular fibrillation.

Her blood pressures for the period of hospital observation of two weeks varied between 180/90 and 160/100.

CONCLUSIONS AND SUMMARY

1. Postmortem and clinical cases are presented of greatly enlarged hearts with isolated pathology in the aortic cusps inducing high grade aortic stenosis.
2. Associated with this pathology there has been constantly found an associated (secondary) easily demonstrable aortic insufficiency.
3. The cusp distortion was due to nodular calcium deposits. Mönckeberg's ideas as to the manner of the deposition are discussed.
4. This lesion and resulting syndrome can induce typical angina pectoris attacks in which the coronaries are undisturbed.
5. A discussion is interpolated which emphasizes the importance and value of careful attention to heart outlines and (in clinical cases) presumptive weights. The idea of lifting the ban on the diagnosis of aortic stenoses in the absence of multiple valvulitis and a rheumatic history is suggested.
6. Since no valve lesion can cope with aortic stenosis in thickening and enlarging the left ventricle there is incentive to investigate such very large hearts for determinative evidence of that lesion.
7. Its etiology can be found in *calcareous nodule deposition in aortic cusps.*

BIBLIOGRAPHY AND NOTATIONS

1. Corrigan, Sir Dominic John: Permanent patency of the mouth of aorta or inadequacy of aortic valves, 1832. Discussed in "Irish School of Medicine" by Jno. Duffey Hancock, M.D., F.A.C., Ann. Med. Hist., 2:196, 1930.
2. Schaudinn, Fritz (1871-1906): Discovered Treponema Pallida in 1905.
3. Keefer, C. S., and Resnik, W. H.: Angina pectoris; syndrome caused by anoxemia of myocardium. Arch. Int. Med., 41:769 (June), 1928.
4. Auenbrugger (1772-1809), Phys. in Chief, Hosp. Holy Trinity, Vienna, 1751: Described art of percussion about 1751. Corvisart in 1808 revived the method of physical diagnosis; however, giving Auenbrugger credit for the same.
5. Mönckeberg, J. C.: Der normale histologische Bau u. die Sklerose der Aortenslappen. Virchow's Arch. f. path. Anat., 176:472, 1904.
6. Clawson, B. J., Bell, E. T., Hartzell, T. B.: Valvular diseases of the heart with special references to the pathogenesis of old valvular defects. Am. Jour. Pathol. 2: (May) 1926.

OPINIONS OF 470 PHYSICIANS IN REGARD TO THE ADVANTAGES AND DISADVANTAGES OF USING BRAN AND ROUGHAGE*

WALTER C. ALVAREZ, M.D.
Rochester, Minnesota

LAST August, Everybody's Health, the Journal of the Minnesota Public Health Association, published an article in which I asked for a little more thoughtfulness in the prescription of bran and other forms of roughage. I reminded physicians and dietitians that one of the two reasons for giving bran is that it is absolutely indigestible, and I suggested that this fact be thought of more often when attempts are being made to treat constipation in persons who are not strong. If one is sure that the patient has the digestion of an ostrich one can, perhaps, dump into his stomach large quantities of bran, dried seaweed, vegetable fiber, seeds, or cold, indigestible grease, and expect him to handle it all without distress. Examination of the stools later may show that digestion has been much interfered with, but if the patient is sufficiently insensitive he will be unconscious of any abnormality, and if his constipation is relieved he will go on his way rejoicing, and insisting that all his friends do as he has done. But let one of these friends happen to have a weak, easily disturbed digestion, or a bowel in which there are narrowed or highly irritable places, and he may find himself unable to handle the extra mass of indigestible material. In this case there will be flatulence, intestinal unrest and discomfort, and perhaps some loss of weight.

The second reason for the giving of bran and roughage is the delusion or obsession that it is only by eating these substances that one can secure all those vitamins, salts, and mineral elements that are essential to life. Actually, anyone who knows anything at all about the subject knows that these dietary constituents can be obtained in large amounts and in more assimilable form from many other foods; in fact, if it is desirable, they can even be obtained from the drug store.

I fear that the future historian of medicine is going to be somewhat puzzled when he comes to write up the story of the vitamin mania of the twentieth century. He will wonder what on earth could have so frightened the dietitians that they should have behaved each day as if a moment's relaxation of vigilance would plunge all their (adult) patients into the throes of scurvy, beri-beri, pellagra, war edema, and xerophthalmia. Perhaps one reason why they fear these diseases so terribly is that they have never seen them and do not know what they are. Similarly, most people today are horrified at the thought of leprosy because they haven't the least idea what it is.

To show how rare the vitamin deficiency diseases are in America I need only say that in twenty years of consultant practice I have seen only one case of beri-beri (due in part to lack of Vitamin B), and one case of scurvy. I may have failed to recognize some cases, but even at that, these can hardly be diseases which everyone should be worrying about during every hour of the day. There are some physicians, dietitians, Red Cross workers, pediatricians, and others who must worry, but they are the ones who take care of the underfed children of the poor, old half-crazy recluses and men out of work who "batch" in cheap hotel rooms or in backwoods ranch houses, fussy old women who live on tea and toast, men and women with ulcer or colitis who try to live for months on milk and eggs, starving farmers in the drought-stricken areas of the South, winter-bound fishermen on the Labrador Coast, inmates of jails and poorhouses, and particularly the explorers who have to live entirely on preserved food. All such persons who live abnormally are in danger, but, so far as I can see, most of us who have a fair income and who eat as our fellows do can have little to worry about.

Whenever I have been so unfortunate as to get into an argument with a whole-wheat enthusiast of the type who would gladly legislate white bread out of existence, I have met this argument: "But, if you don't eat whole-wheat bread, where are you going to get your vitamins and your iron?" Even professional dietitians have tried to floor me with this question, forgetting for a moment what they must have known, that there are many other and better sources of vitamins and iron besides bran. Furthermore, strange as it may seem to the average dietitian, there is no shadow of an excuse for giving roughage when one wants to supply vitamins or chemical elements. One can get more than enough Vitamin A in butter, more than enough of the two B's in a little yeast or extract of wheat kernel (obtainable in a drug store), more than enough C in a little orange juice, and more than enough D in a little tablet of concentrated cod liver oil or irradiated ergosterol. Iron can be obtained in many foods besides wheat and spinach, and, if desired, can be supplied in the form of pills, just as they are now supplied in the standard salt mixture given to the rats in research laboratories. Even the green chlorophyll of plants can now be obtained in tablet form so that there is no real need for the appearance each day of spinach on every sick-tray in every hospital in the land.

---

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota.

What I ask of dietitians is that when they are trying to help patients with a poorly functioning digestive tract, one which for a time should be rested and treated kindly, they should give food which is chosen primarily for its digestibility and palatability and only secondarily for its vitamin content. Actually, in most cases, as when a patient is going to be in the hospital for two or three weeks after an operation, it is only a thoughtless or ignorant person who would worry about the vitamin content of the diet. Everyone who eats sensibly has enough vitamins stored in his body to tide him over a few weeks or even months of semi-starvation.

In order to obtain some idea of the views and practices of physicians in regard to the use of bran, and also of their experience with it, the Public Health Education Committee of the Minnesota State Medical Association sent out a large number of questionnaires to physicians all over the United States. The 470 answers that were received have been tabulated in the editorial office of "Everybody's Health," and the summary and the returned sheets have been turned over to me for comment.

Unfortunately, as everyone knows who has ever attempted to answer a questionnaire of the type sent out, it is difficult to make even a good guess as to his experience or his impressions. When, months ago, I tried to fill out the blank sent me, I felt in somewhat the mood of one of Minnesota's ablest women physicians who wrote on the back of her paper: "I think the formulating of this questionnaire and the answering of it is a laughable waste of time. I am answering questions vaguely . . . my statements based on impressions only and influenced by my opinions of what the answer ought to be. I don't *know* a single fact. Now, I feel better after getting that protest out of my system. This seems to me to be no way of getting at knowledge." But with all this handicap I am forced to conclude as I look over the answers that the inquiry has been worth while, and that it has given information of decided interest and value.

Always, of course, with any questionnaire it is impossible to determine whether or not the opinions of the small group who filled out the blank are representative of those of the larger group who dropped it into the wastebasket. Did the men and women who answered do so because they felt a crusading interest for or against the topic discussed? I do not know. What I would suspect is that the few physicians who take time to answer questionnaires are, for the most part, the ablest, the busiest, the most scientifically minded, and the most conscientious in the community; and actually, as I look over the returned blanks I find the signatures of scores of the ablest medical teachers and practitioners in America.

For a moment it was somewhat surprising to find so many of these men expressing themselves as strongly against the use of bran, but then I remembered that it is not the medical profession that has been leading the crusade for the use of more vitamins and roughage; this fight has been waged largely by lay women, amateur dietitians, self-appointed guardians of the public health, and cranks of all kinds.

A number of the physicians who answered made note of the fact that they formerly prescribed bran but later turned strongly against it. Forty per cent said that they never prescribe it, and 34 per cent prescribe it only occasionally. Similarly, 28 per cent do not prescribe whole wheat bread, and 29 per cent prescribe it occasionally. Fifty-seven per cent, when they do prescribe whole wheat, do so because they wish to add roughage to the diet and 41 per cent prescribe it mainly for its vitamin content. There is, of course, some overlapping in the two groups, that is, some men prescribe it for both reasons.

I was interested to see that so many physicians have found that the addition of bran and roughage to the diet will relieve only a small percentage of the patients with constipation. Many of the doctors commented also on the fact that bran may relieve for a time and then fail to have any effect; the bowel seems to become accustomed to the extra stimulus. Only two of the physicians who answered were really enthusiastic about the use of bran for constipation; one was from Arkansas and the other from Michigan; the man from Battle Creek admitted that the substance would relieve probably only from 50 to 70 per cent of the patients with simple constipation. I noted that he left unanswered the question: Have you ever noticed unpleasant results from the use of bran?

I was struck by the letter of one physician who, like many of our profession, amuses himself and gets rid of his spare cash by running a stock farm. He said that it has long been known to stablemen that the horse, even with his powerful digestive tract which has been devised especially for the handling of rough foods and crushed seeds, does not do well if given much bran. He thought that if he had had to stop giving bran to horses, many of us should stop giving it to sick men and women. A number of physicians recorded the observation that many persons who for a time tolerate the use of bran later get into trouble and suffer with indigestion.

I was surprised at the number of physicians who expressed themselves as being strongly opposed to the use of bran. For instance, the president of the American Medical Association (an experienced gastro-enterologist) wrote: "For ten years I have not permitted the use of bran in any family under my direction." I was not surprised to see that three-fourths of the physicians have observed that bran will produce indigestion and flatulence. As I would expect from my own experience, only a few reported cases in which there was loss of weight and still fewer had seen bran produce intestinal obstruction. A number of physicians who see many patients with diabetes, commented on the tendency of bran to produce rectal impaction. One professor of medicine wrote that in his clinic they call it "bran block." A few physicians remembered having seen rare cases of intestinal obstruction due probably to the impaction of bran above a stricture or a carcinoma.

Some physicians reported cases in which inflammatory processes in the bowel appeared to follow the use of bran, but the more thoughtful ones pointed out, what I think is true, that it would be difficult to say of a particular patient whether or not there was any connection between the use of bran and the presence of enteritis or colitis.

Most of the physicians felt that the propaganda for the wide use of roughage has been definitely detrimental to the public health and comfort, and many expressed themselves strongly on the subject. They pointed out that much of this propaganda has been fostered by laymen who have something to sell, and by faddists and cranks who possess neither good judgment nor adequate information. Practically everyone who answered the questionnaire condemned the tendency of school teachers, instructors in home economics, and amateur dietitians to prescribe rough diets for everyone.

Eight per cent of the physicians remembered having seen cases in which they thought cancer of the bowel might have developed as the result of the ingestion of bran, but some of them admitted that they had no real knowledge on the subject.

The part of the questionnaire which interested me most was that in which the physicians reported the extent of their experience (in adults) with diseases due, or supposed to be due, to avitaminosis. Thirty-two per cent said that, so far as they knew, they had never seen an instance of such disease (in adults); 49 per cent had seen a few cases, and 16 per cent had seen a number of cases; 3 per cent did not answer the question.

I was particularly interested to see the answers of the many men with whom I am acquainted and who I know have good judgment and wide experience. Most of these men stated that in the course of years they have seen perhaps two or three cases of scurvy and one or two of pellagra. Some have seen a few cases in the county hospital but none in private practice. A professor of medicine at Harvard wrote on the back of his blank that he had never seen adults with definite vitamin deficiency "unless pernicious anemia is included, and unless pellagra is later proved to be due to a vitamin deficiency." "To me the remarkable thing among adults, to whom my work is confined, is that there is so little, in fact, almost no evidence that vitamin lack plays any part in the illnesses that we see. It seems entirely safe to advise adults to forget vitamins entirely when they are living in the temperate zone and when they are economically able to eat an average diet such as is dictated by hunger and by the sense of taste."

A former professor of medicine at Johns Hopkins answered that he has seen "pellagra? and scurvy occasionally." A teacher of medicine wrote, "I see two types of deficiency, one, a rare, definite case of pellagra or beri-beri or scurvy, and, second, many adults with chronic disease who have profited by a diet rich in all the vitamins, particularly patients with pernicious anemia and chronic arthritis. I cannot determine whether this constitutes a real deficiency of a mixed sort, or whether it is only an incidental finding and one which can be found with equal frequency, perhaps, in normal individuals. The fact that good results follow from forcing vitamins does not necessarily prove an etiological relation." He adds very wisely, "This is a worthy cause you are promoting, but one must take care that propaganda against propaganda does not also end in being unwarrantedly emphatic."

There are, as one would expect, a number of physicians here and there who have become enthusiastic about avitaminosis and who admit, more or less apologetically, that they are now treating all sorts of diseases with high-vitamin diets. Another professor of medicine at Harvard, a man who is particularly interested in problems of nutrition, wrote that he frequently sees cases of beri-beri, pellagra, and scurvy. He is, however, so well known in his field that patients of this type probably come to him from all over the country. The writer of what is perhaps the best textbook on dietetics in the English language wrote in answer to question eight, "Do you ever in adults see cases of definite deficiency?"—"Probably yes, but extremely indefinite." Incidentally he feels that the propaganda for roughage has been highly detrimental.

As was to be expected, many physicians noted that when they do see vitamin deficiency diseases they see them in the very poor, or in the semi-insane, in cranks and faddists who live on freak diets, in those who are inclined to live on alcohol, in persons with anorexia nervosa, in old persons who live alone, in women who try to reduce unwisely, and in persons who live for a long time on restricted diets designed to cure ulcer, nephritis, or diabetes. One physician in New York wrote that in all the years of his practice he has seen but one case of scurvy, and that was in a man who lived on nothing but bread and tea. A physician in Texas reported having seen a few cases of scurvy among ranchers who live out in the mountains and who depend largely on canned food.

I was interested to see that a physician who has had an enormous experience with patients with arthritis, answered question eight in regard to the frequency with which deficiency diseases are seen, with the statement, "Not clearly." One of the world's leading experts on diabetes answered, "No." A professor of medicine in Chicago wrote, "Yes; impression only, no definite knowledge." Another professor of medicine in Chicago wrote: "Rare in private practice; occasionally in the county hospital." Another able clinician said: "I think I do rarely, as in cases of ulcer." Another professor of medicine whose particular interest is gastro-enterology wrote: "Rarely, and then among the poor. I have seen two cases develop during treatment for ulcerative colitis." Another professor of medicine, who is a national authority on problems of nutrition, wrote, "Very rarely." One physician unknown to me, but evidently an enthusiast, wrote, "Daily, all types."

Another physician who has written a textbook on gastro-enterology wrote: "Vitamins are overdone and over-emotionalized at the present time. I do not believe that I can recognize this condition if it exists." One of the ablest physicians in the Northwest wrote that he has seen one case! Another physician, who has had perhaps the largest experience in internal medicine in the Northwest, remembered having seen three cases of pellagra. One of the ablest and busiest internists in Minnesota wrote, in his characteristically vivid way: "The rarest thing in our practice. In Minnesota it is almost impossible for an adult who is not a 'nut' on diet to miss enough of the needful vitamins. The case for babies and young children, of course, is different." One of his able partners, answering the same question, said, "Not specifically certain." It interested me also to see that those physicians at The Mayo Clinic who answered the questionnaire reported, out of their large experience, only an occasional case of scurvy or pellagra.

As one would expect, most of the reports of disease due to lack of vitamins came from the South, and particularly from the poorer districts of the South, where pellagra is endemic. Even from there, however, it is noteworthy that some physicians reported seeing much pellagra, while others said it was rare. There was only one physician who took a strong stand against my statement that vitamin deficiency diseases are probably rare, but he is from the South, and he admits that he is classifying as avitaminosis any disease in which the patient improves on a diet rich in vitamins. He said, "I have seen hundreds of cases in this category, where general health was markedly improved by the addition of vitamins. Pellagra exists often in this class. In my opinion Alvarez is all wrong. The publication of such a doctrine, which is contrary to the views of those who have done the work, seems harmful to me." Most of the physicians, however, seemed to feel as I do, that although we are probably missing cases of dietary deficiency disease and should be more keenly on the watch for them, we must keep our feet on the ground and must not soar off with the faddists into realms of fancy.

To sum up: this questionnaire has shown clearly that the physicians of this country are not enthusiastic about the use of bran. They realize that it can relieve only a certain number of patients with constipation, and in them the relief is often temporary. Most of the physicians report also having seen indigestion and flatulence caused by the use of bran and other rough foods. In fact, many of them have seen so many instances of this that they now refuse to allow any of their patients with indigestion to take these foods. Almost all agree that the present propaganda for the addition of roughage to the diet has been more harmful than beneficial, and almost to a man they condemn the practice of school nurses and others who prescribe the same rough diet for everyone and who offer prizes for the child who can eat the most spinach.

Finally, I think we can say that, except for a handful of enthusiasts who are riding their avitaminosis hobby rather hard, the physicians of the United States are very rarely seeing in adults any disease which they can ascribe with certainty to a deficiency in diet. Only one exception need be made and this is for those physicians in the South who practice among the poor. Many of them are seeing cases of pellagra, scurvy, and general undernourishment.

It would seem, therefore, that unless times ever get so hard that men and women all over this country come close to the edge of starvation, our hospital dietitians can rest easy, and they can with safety stop stuffing their transient guests with foods rich in vitamins. The time may even come again when a six-months-old infant can nurse happily at his mother's breast without having to stop to drink orange juice and cod liver oil, and to eat spinach. As in the good old days, his mother will eat these substances for him, and perchance, if she doesn't like them overmuch she will get a cow to eat them for her so that she can get the necessary concentrates in the cow's milk.

SOME POINTS IN THE DIFFERENTIAL DIAGNOSIS OF CHEST DISEASES*

J. A. Myers, Ph.D., M.D., and Leila M. Kernkamp, M.D.
Minneapolis

In ancient times most chest conditions were known as consumption or phthisis. There were many kinds of phthisis; in fact as late as the time of Sauvages, 1706-1767, this disease was classified into twenty different kinds. Morton reduced the number to sixteen, Portal to fourteen and Baylc, living from 1774 to 1816, reduced the number to six. Baylc and Laennec were close friends, but Baylc died of tuberculosis the year Laennec presented the stethoscope (1816). With this new device for examination, with a splendid training in anatomy and pathology, and with a wide experience at the postmortem table, Laennec changed the interpretation of physical signs and symptoms of diseases of the chest. He was able to take out of the classification of phthisis much that it formerly contained. He worked out carefully such diseases as gangrene, pneumonias, edema, emphysema, and atrophy of the lungs. He took melanosis from the category of pulmonary phthisis, considering such cases as due to anthracosis, or cancer. He also took cancerous phthisis from pulmonary phthisis. Of course, many of his diagnoses were not made before death, but were based upon autopsy findings.

In the century that has passed since Laennec's death, we have had many developments which have facilitated work in differential diagnosis in the living body. Inoculation methods had been attempted a number of times, but in 1843 Klenke found that he could transmit consumption from persons to animals by inoculating into the bodies of animals tuberculous material from the postmortem table. His work was confirmed and carried much further by Villemin and later by Conheim. In 1882, Koch announced the discovery of the tubercle bacillus and since that time the finding of this organism in suspected material from patients has been an extremely valuable point in differential diagnosis. Other aids in diagnosis such as the patient's history, physical examination, the tuberculin test, the X-ray, the bronchoscope, the microscope and iodized oils are doing much to differentiate non-tuberculous from tuberculous lesions.

From the patient's history one can frequently obtain very definite leads. The occupation is of great importance in certain diseases; for example, a person who works about a farm, particularly with farm animals, may be suffering from actinomycosis or aspergillosis. The granite worker, the coal miner and those in other dusty occupations may be suffering from pneumoconiosis.

Occasionally when no cause can be ascribed to an area of disease in the lung a careful history taker may elicit the fact that shortly before the disease began the patient suffered from a severe attack of choking, perhaps while eating a meal. In such cases the aspiration of foreign body must always be considered.

Following pneumonia, pulmonary abscess and empyema are very common complications, as illustrated by the following case:

O. P., a female, 18 years of age, developed pneumonia and nine months later a diagnosis of tuberculosis was made. She then complained of persistent cough, offensive sputum and loss of weight. She went to a sanatorium for the tuberculous and after three months no evidence of tuberculosis had been found. She was discharged with a diagnosis of pulmonary abscess at the left base.

When we first saw her on the advice of the sanatorium staff artificial pneumothorax was instituted. A large adhesion prevented complete collapse of the left base. Thoracotomy was performed and the adhesion was severed. Artificial pneumothorax was continued two years.

It is now nine years since the pneumothorax was instituted and she is in excellent health.

Not all cases of pneumonia are detected, particularly when serial X-ray examinations are lacking. The person who has an abscess formation of the lung will sometimes give a history of having had a severe attack of influenza with high fever for a few days. In many of such cases the patient actually had pneumonia which

---

*From the University of Minnesota Chest Clinic and the Minneapolis General Hospital Chest Clinic. Presented before the Red River Valley Medical Society at Thief River Falls, Minnesota, on October 19, 1928, the Cass County Medical Society at Fargo, North Dakota, on November 22, 1929, and the Medical Staff of the Lymanhurst School for Tuberculous Children at Minneapolis, Minnesota.

This paper was prepared with the aid of a grant from the Research Fund of the University of Minnesota.

was undetected. Areas of unresolved pneumonia are also often observed. The patient must be questioned as to any operative procedures which preceded the development of pulmonary disease. Was a tonsillectomy or any dentistry done just before the disease appeared?

History of exposure to disease, particularly to tuberculosis, is of considerable significance. In persons coming from homes where tuberculosis has been known to exist this disease must be considered. One should also bear in mind that a history of exposure to pneumonia is significant. On one occasion we saw five cases of pneumonia develop simultaneously in one family after the death of the father from that disease.

A history of malignancy in some other part of the body, even in one thought to have been operated upon successfully, is important. The following case illustrates this point:

C. F. B., a female, 47 years of age, five years before our examination, had had a pelvic tumor removed. Three years later she began to complain of shortness of breath and cough. Three months before we saw her, 500 c.c. of clear fluid was removed from the right pleural cavity. There had been no loss of weight or strength.

On examination dyspnea was present on slight exertion. Her respiratory rate was 25. There were palpable lymph nodes in the left axilla 2 cm. in diameter.

The chest examination revealed dullness at the right base and bronchial breathing over the same area. Hyperresonance was present in the right axilla where the breath sounds were absent.

The X-ray examination showed a partial pneumothorax at the right base with a small amount of fluid. In the left upper lobe was a shadow strongly suggesting tuberculosis. Subsequent studies, however, led to a diagnosis of metastatic malignancy of the lung (Fig. 1). Deep X-ray therapy was administered, but death occurred about eighteen months after our first examination.

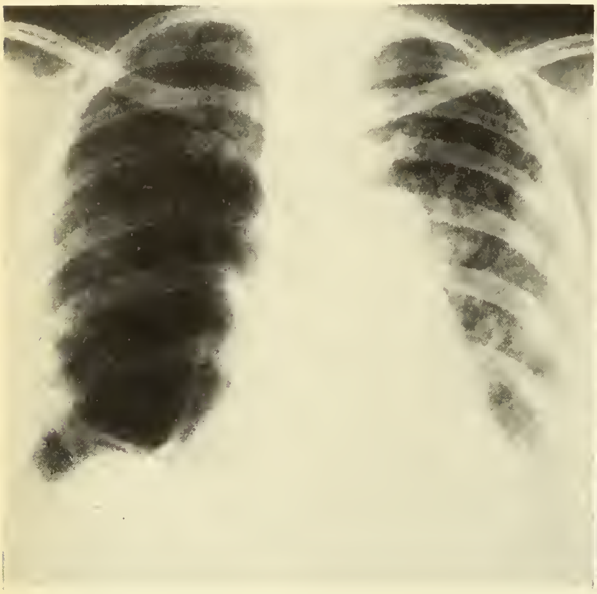


Fig. 1. Roentgenogram of the chest of a woman of forty-seven years, showing spontaneous pneumothorax on the right side with metastatic malignancy involving the left lung.

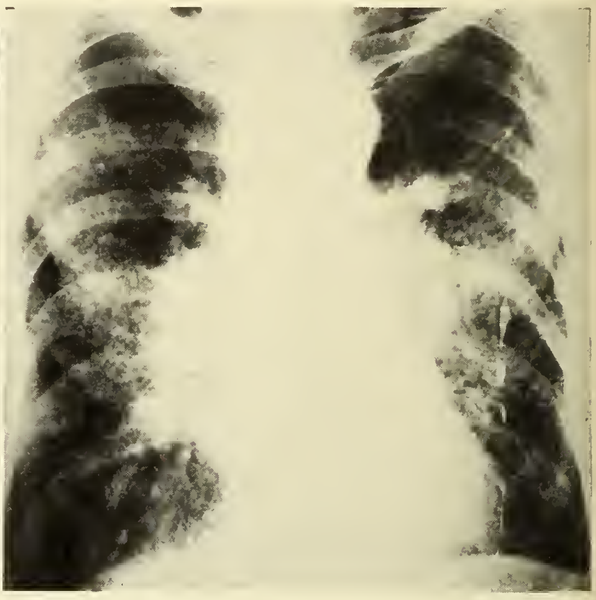


Fig. 2. Roentgenogram of the chest of a man of sixty-seven years, showing metastatic carcinoma involving both lungs.

A history may lead one to suspect carcinoma in some other part of the body, although the most marked present symptoms are referable to the lungs, such as in the following case:

C. A., a male 67 years of age, complained chiefly of dyspnea, but the history revealed the fact that there had been some pain in the epigastrium for one year. He complained of loss of weight and appetite, weakness, belching of gas and occasional vomiting for three months.

On physical examination he was found to be dyspneic, weak and emaciated. The lymph nodes were palpable both in the supraclavicular fossa and in the left axilla. There was a palpable mass in the left upper quadrant of the abdomen.

X-ray of the chest and gastro-intestinal tract revealed evidence of gastric carcinoma with metastases to the lungs and the mediastinum (Fig. 2). Death occurred two months later.

One must not overlook the fact that primary carcinoma of the lung occurs more frequently than we formerly believed. The following case is a good example:

E. P., a male, 34 years of age, had been in excellent health until four months before the first examination. Then he complained of pain in the right chest, loss of appetite, strength and weight, shortness of breath and fever ranging from 99° to 101° F.

The examination revealed limitation of movement on the right side, flatness in the right axilla and dullness over the right chest anteriorly. There was increased whispered voice in the right axilla. No râles were heard. The liver was 3 cm. below the costal margin, but no other abnormal abdominal signs were elicited. There was marked clubbing of the fingers.

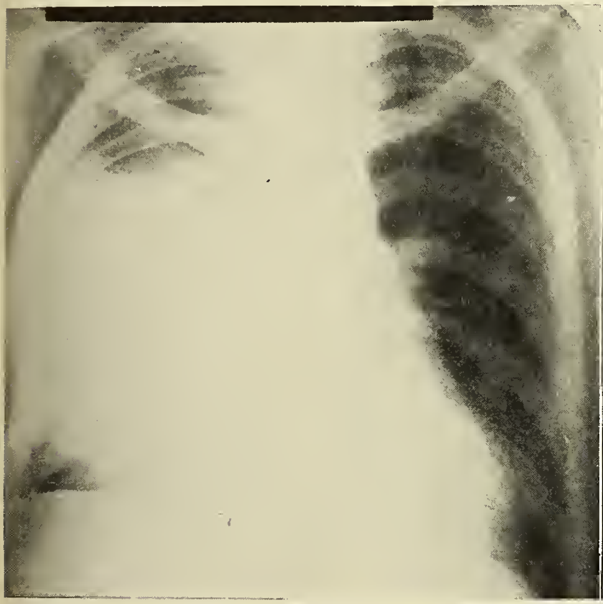


Fig. 3. Roentgenogram of the chest of a man thirty-four years. Postmortem examination showed primary carcinoma of the right lung with metastasis to the regional lymph nodes.

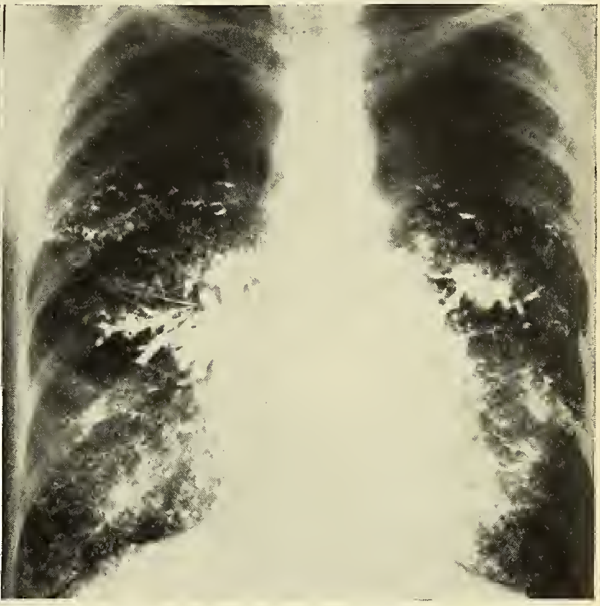


Fig. 4. Roentgenogram of the chest of a woman of thirty-one years after lipiodol had been introduced into each bronchial tree. Case of bronchiectasis.

The X-ray examination revealed what appeared to be a primary new growth arising in right lung (Fig. 3).

Deep X-ray therapy was administered.

The postmortem examination revealed carcinoma of the right lung with metastases into the bronchial lymph nodes on the right side.

Foci of infection of the mouth and upper respiratory tract are often a cause of septic conditions in the lungs, as shown in the following cases:

G. L., a male, twenty-three years of age, for six years had frequent colds and cough with profuse expectoration of purulent odorous material. At times he noticed a numb feeling of the upper jaw. X-rays of the teeth were negative on two occasions.

The chest examination revealed increased whispered voice over the right apex and moderately coarse râles at the right base posteriorly.

The nose and throat examination revealed nasal polyps and bilateral maxillary sinusitis.

The X-ray examination of the chest showed evidence of fibroid tuberculosis of the right middle lobe, but subsequent examinations have led us to believe that this involvement was a non-tuberculous abscess. Bronchiectasis was present in the right lower lobe.

Nasal polyps were removed, submucous resection and maxillary sinus "window" operations were performed. Three abscessed teeth and two carious teeth were removed.

With the removal of these foci of infection two years ago the chest symptoms have gradually disappeared until now he only coughs and expectorates with an occasional "cold."

T. W., a male, forty-two years of age, complained of cough since having ether anesthesia three years before we first saw him. He coughed violently and expectorated profusely. The sputum was purulent and offensive in character. He had changed climate believing tuberculosis to be the cause of his symptoms.

The examination revealed moderately coarse râles over the bases of his lungs, more marked on the right side.

The nose and throat examination revealed bilateral maxillary sinusitis.

The X-ray examination showed evidence of bronchiectasis in both lower lobes, more extensive on the right side.

Permanent openings were established in both maxillary sinuses with great relief of symptoms.

There are no pathognomonic symptoms referable to the chest. Pleurisy may be caused by many conditions, but pleurisy with effusion not preceded by or accompanied by acute respiratory disease is very often due to tuberculosis, perhaps so in ninety to ninety-five per cent of the cases. Hemoptysis is also caused by many conditions. At one time we believed that ninety-five per cent of the pulmonary hemorrhages are due to tuberculosis of the lungs. Observations have shown that patients with bronchiectasis are subjected to hemorrhage more frequently than those with pulmonary tuberculosis. The following cases are good examples:

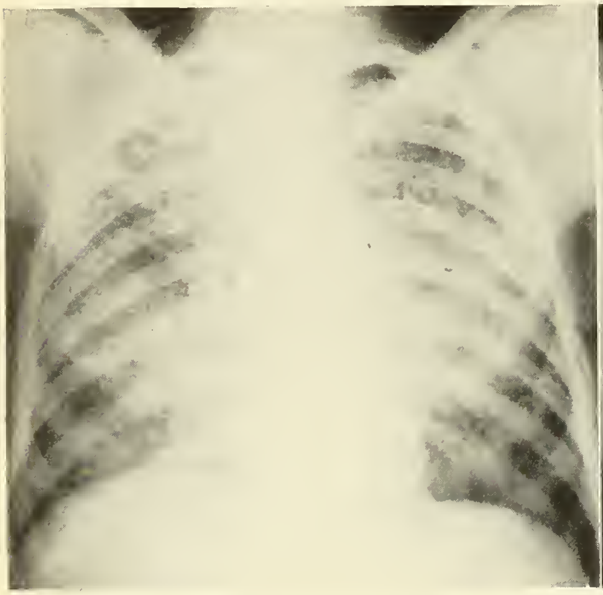


Fig. 5. Roentgenogram of the chest of a man of thirty-two years of age. This shows miliary tuberculosis, involving both lungs. There is an old lesion with cavity formation in the right upper lobe.

A. G., a female, thirty-one years of age, for ten years had a productive cough with profuse, purulent, offensive expectoration, measuring about one cupful a day. One year ago she had a hemorrhage of one-half cup of bright red blood. In the last two months she has had four frank hemorrhages. Ten years ago she had acute rheumatic fever and four years ago she noticed swollen ankles. There has been no swelling since.

The examination revealed a thin, weak and toxic appearing female, with limitation of chest movements. Dullness and râles were present over the base of both lungs.

Her sputum was negative for tubercle bacilli on many examinations.

The X-ray examination following the introduction of iodized oil showed bronchiectatic cavities (Fig. 4).

The paranasal sinuses were clear.

Diagnosis: Bronchiectasis, bilateral.

G. G., a male, forty-two years of age, two weeks after a tonsillectomy performed two years before our first examination, spat up blood and ran a low grade temperature over a period of several weeks. He had frank pulmonary hemorrhages eight different times and had a continuous cough with expectoration. About fifteen months later he had a bronchoscopic examination which revealed bronchiectasis of the left side. Aspiration of the bronchiectatic cavities gave him definite relief. Three months later he began to cough and run a fever. Two months later he had such a severe hemorrhage that he was almost exsanguinated. Artificial pneumothorax was administered on the left side, which immediately controlled the hemorrhage, cough and fever. Three weeks later he developed a bronchial fistula into the left pleural cavity with a resulting empyema. The fistula was valve-like in character, increasing the pressure in the left pleural cavity to such an extent that the heart and mediastinum were pushed to the right, causing great dyspnea and exhaustion. Closed drainage was instituted at once, with slow removal of the fluid. The cavity was irrigated with Dakin's solution every two hours, for twenty-three days, with the exception of five days when normal saline was substituted because of the irritative action of the Dakin's solution in the bronchi. Eleven days after closed drainage was instituted he remained temperature-free and ten days later the pleural cavity was sterile. Since discharge from the hospital two years ago this patient has gradually returned to his activities until now he is carrying on strenuous farm work.

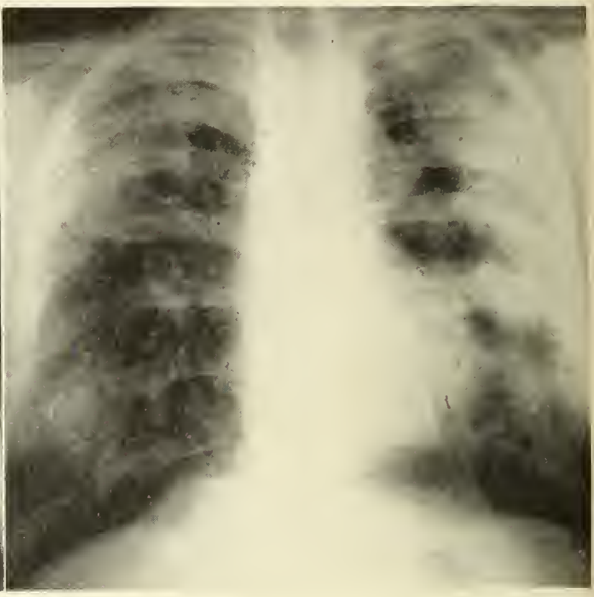


Fig. 6. Roentgenogram of the chest of a man of forty-eight years suffering from pneumoconiosis.

Patients with cardiac disease may also have pulmonary hemorrhages, as shown by the following case:

A. H., female, twenty-one years of age, on two occasions at two weeks intervals spat up bright red blood in an amount of one teaspoonful. She had noticed a slight cough and lassitude for one month.

The examination revealed normal lungs, but there was a systolic thrill and a presystolic murmur transmitted to the left axilla.

The X-ray showed a slight increase of the outline of the left cardiac border. The lungs were normal.

Diagnosis: Mitral stenosis.

Persistent cough is frequently caused by conditions other than tuberculosis. Impacted cerumen may result in paroxysms of coughing. Involvement of the paranasal sinuses very frequently cause cough. When cough is present, there may or may not be sputum. The color of the sputum is of considerable significance. It may vary from clear appearing mucus to a deep yellow or green and in some cases it is streaked or blood tinged. In septic conditions such as lung abscess and bronchiectasis the sputum may have a very foul odor. Again, offensive sputum may be present in cases of pulmonary tuberculosis where it accumulates in cavities and remains over a considerable period of time.

Weight loss occurs in many pulmonary lesions. It is a common symptom in malignancy and pulmonary abscess as well as in tuberculosis. There is not one symptom which is pathognomonic of any chest disease.

In an evaluation of the phases of an examination the relative importance has changed considerably. At one time we placed most emphasis on physical examination. Today, as much as we may dislike to face the fact, we are compelled to place the physical examination below first place.

When the patient presents himself for examination the first time, the intracutaneous tuberculin test should be applied. Although a great deal has been said to the contrary, tuberculin is a very valuable agent in differential diagnosis. This is particularly true since tuberculous infection is no longer universal even in adult life. When definite pulmonary findings are present and the intracutaneous tuberculin test remains negative after the dose has been increased to one or two mg., one can be reasonably certain that a nontuberculous condition exists. In conditions which have been said to reduce hypersensitiveness to tuberculin, such as overwhelming tuberculous disease, and acute febrile diseases, if enough tuberculin is administered a positive reaction will appear. In some cases with negative cutaneous tests it may be necessary to resort to the subcutaneous test. This, when properly applied, is without harm to the patient and gives the physician a good deal of aid in diagnosis.

A. J., female, 29 years of age, complained of cough and expectoration that had been present for many years. She had influenza nine months ago which left her extremely weak and tired. She had an occasional increase in temperature for the last two years and had changed climate, being strongly of the opinion that she had pulmonary tuberculosis.

The chest examination revealed no abnormal signs except a few râles over the bases of her lungs posteriorly.

The X-ray examination was negative, except for accentuation of the bronchial trunks.

The sputum was negative for tubercle bacilli on many occasions.

The basal metabolism was minus 14 per cent.

The cutaneous tuberculin test was negative. We resorted to the subcutaneous tuberculin test administered in the usual manner. She reacted negatively to ten milligrams.

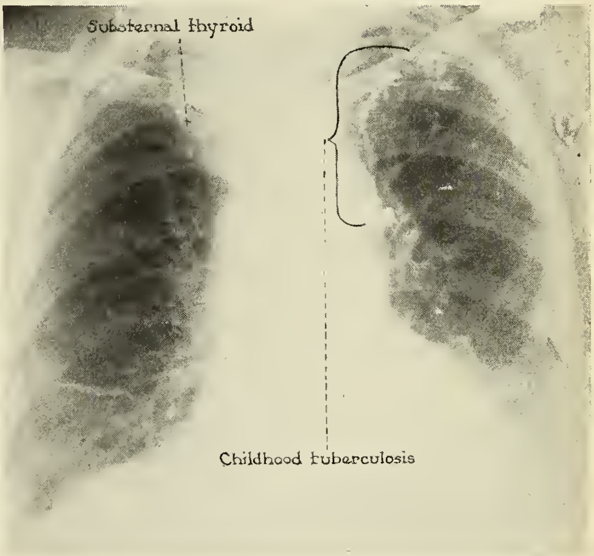


Fig. 7. Roentgenogram of the chest of a woman of sixty-five years. In addition to hypertension heart and substernal thyroid gland, this illustration shows evidence of the childhood type of tuberculosis in the left upper lobe and the left hilum.

In the two years that have passed since this examination, no further symptoms or findings have appeared.

The X-ray has been in use sufficiently long to make it possible for us to give it a very definite place in the evaluation of diagnostic data. We are firmly convinced that a carefully made X-ray examination in the diagnosis of chest conditions is second only to the finding of specific microorganisms. In many cases one cannot rely upon a fluoroscopic examination. A single film of the chest is of considerable value, but is inferior to well-made stereoscopic films when examining for small areas of disease. Such films may reveal evidence of disease in the lung parenchyma before signs are present. If the normal chest is well understood and the stereoscopic films reveal no changes from the normal in the lung parenchyma, one is quite safe in rendering a negative diagnosis of pulmonary pathology. However, it is sometimes necessary to make lateral films in order to visualize areas of the lungs obscured by the heart. This is extremely helpful in questionable cases; it gives one a confidence that is impossible to obtain in any other way. The location of the lesion revealed by the X-ray is also of considerable value in differential diagnosis. Lesions located in the lower part of the lung usually are nontuberculous; those in the middle portion of the lung are about one-half tuberculous; while those in the upper portion of the lungs are usually tuberculous. This does not mean, of course, that a nontuberculous lung abscess may not develop in the upper part of a lung. The X-ray aids greatly in outlining the extent of disease as seen in Figures 5 and 6. Again, it often brings to light unsuspected lesions as shown in Figure 7.

Iodized oil aids the X-ray examination quite materially. It is easily introduced into the bronchial tree, and when all other diagnostic aids have failed, the visualization of the bronchus and its ramifications may aid in diagnosis (Fig. 4).

Improved laboratory methods and the recognition of their great value makes differential diagnosis much easier than in the past. Methods of differentiating between true tubercle bacilli and other acid-fast bacilli are extremely helpful. Concentration methods aid tremendously.

We have come to know that inability to find tubercle bacilli does not mean a great deal unless the search for them has been a long and carefully made one. This is because only approximately one-third of the minimal cases of pulmonary tuberculosis have tubercle bacilli present in the sputum. In other words, there is not sufficient breaking down of the lesion to free bacilli in nearly two-thirds of the early cases of pulmonary tuberculosis. Therefore, we must not wait for the finding of tubercle bacilli before beginning treatment, as the patient often has lost his best chances of recovery before they appear in the sputum. The examination for tubercle bacilli must be a very persistent one, as shown in the following case:

A. J., a female, 31 years of age, had influenza six years ago followed by pneumonia with empyema of the left chest. Closed drainage was used. She was symptom-free for one year, when pus was again present in the left chest. Open drainage relieved symptoms. After nine months she developed a severe cough with expectoration of profuse and offensive sputum. Six months were spent in a tuberculosis sanatorium, where tubercle bacilli were not found in either sputum or pleural exudate. One year ago she had twelve pulmonary hemorrhages. Again no tubercle bacilli could be found. Inguinal lymph nodes were removed which proved to be tuberculous. She rested in a sanatorium and was later advised to have thoracoplasty.

Physical examination revealed enlarged cervical and supraclavicular lymph nodes on the right side. There were enlarged, tender lymph nodes in the left axilla and in the inguinal and femoral regions bilaterally. There was limited movement of the left chest. Tactile fremitus and whispered voice were increased, and moderately coarse râles were elicited over the entire left chest. Thirty-six sputum examinations were negative for tubercle bacilli, but the guinea pig inoculation was positive. Five months later the sputum became positive for tubercle bacilli on direct smear. The X-ray then showed evidence of pulmonary tuberculosis in the right upper and lower lobes and thickening of the pleura on the left side. Barium enema under the fluoroscope gave evidence of colitis, which was thought to be tuberculous.

Again, we know that, since paratubercle bacilli are abundantly present in nature, we must be extremely careful about making diagnoses on the presence of a few acid-fast bacilli in the absence of any other finding. One or two positive sputum reports may be made in cases entirely negative to tuberculosis. In addition to paratubercle bacilli, one must keep in mind errors which occur in laboratories. The following case illustrates this point:

W. K., a male, twenty years of age, following an operation for appendicitis a year before our examination, developed pneumonia on the right side. Convalescence was extremely slow and finally a diagnosis of tuberculosis was made, and he was sent to a sanatorium, where tubercle bacilli were reported from sputum examinations on two occasions.

On examination, after he had spent twelve months in a sanatorium, râles persisting after cough were elicited in the right axilla and right base posteriorly. The left lung was clear.

The X-ray film showed no evidence of tuberculosis. The slight shadows in the right lower lobe were suggestive of an old lung abscess. The sputum was negative on many occasions.

Diagnosis: Pulmonary abscess following pneumonia.

Since our examination this patient has been engaged in strenuous physical work for three years with no recurrence of symptoms.

Careful investigation of the sputum for various kinds of microörganisms often leads to diagnoses of nontuberculous conditions, such as pulmonary distomiasis, actinomycosis, aspergillosis and oidiomycosis. Stovall and Bubolz have recently reported the finding of forty strains of yeast-like fungi isolated from sputum. Lemon has called attention to coccidioidal granuloma being more widespread than is currently believed.

Sayers and Meriwether selected from 18,000 roentgenograms 125 with unusual appearances and which were variously interpreted as being the result of miliary tuberculosis, silicosis, tuberculosis or pneumomycosis. With two exceptions, the subjects appeared healthy. Tubercle bacilli were found in only two cases of eighty-eight in which the sputum examination was made. Fungi were found in the sputum of many cases. The fungi were identified as asperigillus fumigatus fisheri and asperigillus niger. All but one of the 125 cases were associated directly with farming or the handling of grain such as wheat.

The newer modifications for elastic fiber staining are helpful, since elastic fibers in the sputum, accompanying tubercle bacilli, always indicate a pathologically active tuberculous process. On the other hand, the presence of elastic fibers and the absence of tubercle bacilli over a considerable period of time is very strong evidence of the existence of a nontuberculous pulmonary process.

The bronchoscope has been of great help in differential diagnosis and its more general use promises to further aid in differentiating other conditions from tuberculosis. This method makes it possible to actually visualize the inner parts of the trachea, the bronchi and some of their larger ramifications. It also makes biopsy possible in some questionable cases. It is significant that in the past few years primary carcinoma has been detected by this method by Vinson, Moersch and others in a surprisingly large number of cases. Doubtless in years gone by these would have been diagnosed tuberculosis without postmortem examinations. It is obvious, therefore, that the methods of differential diagnosis, even beginning with Laennec's time, have made it possible to detect many nontuberculous conditions which previously were regarded as tuberculous. No doubt, this has played a considerable role in reducing the mortality from tuberculosis and, in recent years, it must be considered as one of the important factors causing the apparent rapid decline in the tuberculosis death rate.

THE PROBLEM OF THE FUNCTIONAL NERVOUS CASE*

W. H. Hengstler, M.D.
Instructor in Nervous and Mental Diseases, University of Minnesota
Saint Paul

THERE is perhaps nothing in the field of medicine, today, more deserving of consideration than the so-called functional nervous case. To the man practicing general medicine and surgery it presents the picture of many and varied subjective symptoms not substantiated by objective findings: the oft-returning and complaining patient who fails to improve and whose burden of woe falls none too lightly on the shoulders of the harassed but uncomplaining doctor. Drugs, operations and arguments fail in giving relief, and the patient travels around from one to another of us and then descends to the chiropractor's level and to that of various other cults. To the neuro-psychiatrist, these are fascinating cases, because they invoke the study and analysis of personality in all its colors, for a personality which has gone awry can cause just as much, if not more, suffering than any physical disease An exhaustive study of this subject is quite impossible in a brief paper of this kind, but a comprehensive review, touching the high spots, may prove interesting and instructive.

It is in order, first of all, to discuss in a general way the factors which are responsible for producing the functional nervous case. Heredity plays its part—not in the transmission of actual disease or structural defect, but in helping to establish the pattern of personality in the individual. Personality may be defined as the reaction of a person to his environment, and his reaction is going to depend to some extent upon the equipment with which he is born. The so-called "neurotic temperament" is definitely transmitted from parent to child—not always but often—and consists merely in the lack in the offspring of normal resistance to meet the experiences he must encounter in passing through life. This failure of resistance may show itself early—at the age of puberty, when evolution is taking place, or even earlier—or it may hide itself under various masks until the latter part of middle life and become very troublesome during the involutional period. In any event, it is rare for an individual of this type to go through life without some demonstration of his "psychological unfitness."

The next great factor is that of experience. As already pointed out in a previous presentation, there is no way of foretelling just what experiences a person is going to meet in life. No two persons meet exactly the same experiences and no two prsons would react exactly alike to the same experiences, but with heredity as a background, experience becomes a vital factor in disorder of personality, and out of experience rise all the myriad reactions and effective symptoms which so ensnare the patient and make his life unbearable.

Greatest of these is fear. It is undeniably the outstanding symptom—the cornerstone, if you please—of the false structure which is built up in the personality of the individual so affected, and fear is invariably the product of experience—the lasting impression which is gained through some shock, physical or psychic. Fear may show itself early or late, after such shock, but can usually be traced directly to its source. Fear may take many forms, common among which are fear of insanity, fear of syphilis, fear of cancer or tuberculosis, and fear of suicide. A patient, now under our care, was so permeated with the fear of suicide that she would remove implements, such as knives and hatchets, from the house, because the sight of them suggested to her that she might use them to kill herself. There was no desire to die—in fact quite the contrary—but the ever-present fear that she might commit suicide haunted her night and day. Another patient now being treated, a woman of seventy, is obsessed with the fear of cancer. She saw her husband die of cancer fourteen years ago. Twelve years ago she had a breast removed for carcinoma, so she, herself, while in excellent physical health, with not a possibility of malignancy, lies in mental torture engendered entirely through fear of this disease. Less common are other bizarre forms of fear, such as the fear of making mistakes, the fear of going into high places, the fear of being in crowds of people, and that terrible affliction—the inferiority complex. A few years ago, a physician from Iowa consulted us because of his fear of mistakes. He would dispense his medicines to his office patients in the afternoon, and in the evening he would drive miles into the country after them going to their homes to check up what he had given—consumed with an anxiety and fear that he might have given the wrong drug. One could write a volume on fear, itself, for its outstanding position as a symptom in functional nervous cases is unimpeachable.

---

*Read before the Tenth District Medical Society, Eau Claire, Wis., Oct. 2, 1930.

So many other elements enter into the pattern of these cases that to enumerate them or to classify them here is out of the question. The early life of the child, the home environment and the "parent-child" relationships are worthy of mention. Lack of proper discipline, absence of love and compatibility in the home, excessive coddling and petting by fond parents during childhood, or excessive anxiety for the child's welfare on the part of the parents, are all very important. Sex education and sex information, imparted at about the age of puberty, will save many a child from defensive reactions which may cause untold misery later on. Many an adult woman has confessed that she had never lost the sense of shame produced when she first experienced menstruation. Not having been informed of this event by her mother, a lasting impression of shame and inferiority was made, which cropped out from time to time and gave her an unbearable state of mind. Many a youth develops serious personality changes because he believes that nocturnal emissions are evidence of some shameful or defective condition. The subject of masturbation and the false assertion to the child that it will produce insanity often bears fruit in later years as a vitally depressive factor in functional nervous disorders. While we are not particularly Freudian in our viewpoint, nevertheless it cannot be denied that the cause of a great many functional nervous disorders lies in faulty sex-adaptation. The rising generation of today is peculiar in its sophistication in all matters pertaining to sex. Just what has caused this is difficult to say, but the fact remains that our youth of both sexes are very blasé in their attitude towards things that a generation ago were left for those of more mature years. This condition, together with liquor and tobacco and all-night parties, must have its effect on the stabilization of the nervous system of the still-developing boy and girl. Sex-freedom and clandestine sex-indulgence by the young people from sixteen to twenty years of age results in premature acquiring of experiences that should be reserved for those somewhat older. This, in turn, tears down "moral fiber" and causes fears and repressions and shame, which produce defensive reactions of various kinds, which we commonly see. We have seen a girl of eighteen develop an hysterical paralysis of bladder and both lower limbs, through fear of pregnancy following sex-indulgen with a married man, and augmented by the fear that her parents would find it out and disown her. We have seen a woman of fifty, who was profoundly depressed because years ago she had tasted clandestine sex-life. We have, at the present time, under observation, a young unmarried woman of thirty-two, who has an overpowering sense of shame and inferiority because "no one wants her." Filled with normal maternal instinct and denied her own children, she lavishes excessive affection on her mother, as a compensatory measure, and is unable to take a position and work because she gets so weak and tired and her back aches so if she tries it. So we must admit that sexual maladjustment plays a great part in the production of these various disorders. Passing on, we encounter the bachelor and old-maid complex, which causes so much misery during the last two decades of life. Unfortunate indeed is the girl who gives up her own matrimonial prospects to take care of an invalid or incompetent parent and who sacrifices her own life's happiness on the mistaken altar of duty. All goes well, perhaps, until finally the parent dies, leaving her alone at forty-five or fifty. She, deprived of her task, and having no child or husband or other vital interest in life, promptly turns in on herself and develops all sorts of functional or emotional symptoms. Nothing is more pitiable than the bachelor of sixty or more, who has no one but himself to think about. His life work is done and he has no other outlet but consideration of his own grievances and his own infirmities, and so he spends his declining years, gradually becoming an egocentric, depressed and morbid old man. We have, under our care at the present time, a spinster of sixty-five. She is all alone in the world, with a small income derived from a legacy of some years' standing. With no one but herself to think of and with all normal instincts in life denied her, she turns periodically into herself and becomes morbid, anxious, depressed and sleepless, and about once a year comes to us for two or three months of treatment. The treatment consists in placing her in the hospital, among agreeable surroundings, where she can make friends and have personal attention from the nurses, and she invariably improves, gets well and goes home happy, to have another attack the next year.

An apology, perhaps, is necessary for presenting these elementary facts in the preceding paragraphs, but they are presented for a purpose, and that is to call attention to the importance of the background of the individual. To handle successfully the functional nervous case, one must study the individual more than the symptoms. Perhaps the greatest difficulty in handling cases of this kind lies in the length of time it takes, for time must be taken if success is to be achieved. To study the individual requires that we secure a word picture of his life as it really has been. His symptoms are of minor importance, for in the true functional nervous case the symptoms are merely local subjective manifestations of a general condition and have no particular reference to the part of the body where they are located. Too often when a patient complains of "headache," the Doctor hurriedly prescribes an anodyne, when a proper analysis of the complaint would prove it to be a sensation of pressure or constriction, so common in depressed individuals, and not pain at all. The head, the stomach, the heart and the bladder are those parts most frequently complained of. The patient believes he is going to lose his mind or thinks he has a tumor in the brain because of the sensation of pressure in his head, or he believes he has heart disease because of palpitation and distress in the left chest. He often says he cannot lie on his left side in bed, because he chokes or feels his heart beating; or he fears cancer because he has gastric distress and belches or vomits. He thinks he has "kidney-trouble" because he urinates so frequently. A careful history in cases of this kind, with a complete review of the individual's life, is of utmost importance, and while the history is being taken the patient should be studied as a whole. Then follows a complete examination to rule out definitely any organic disease and any possible foci of infection. The diagnosis of "psychoneurosis" should be the last diagnosis made.

Within the past sixty days, the writer has had referred to him two cases which were sent in by their physicians as cases of functional nervous disorder. The one proved, on examination, to have multiple myelomata of the vertebral column, and the other an inoperable carcinoma of the pylorus, gallbladder and liver. In both cases the diagnosis was established clinically and verified at autopsy. We are firm believers in complete and exhaustive examinations to rule out infection and disease. We admit readily that obscure infection and obscure disease will produce the symptoms of the functional neuroses, and we repeat that the diagnosis of functional neurosis should be the last one made, but having excluded disease and infection and having studied the patient and arrived at our conclusion, we do not hesitate to make our diagnosis, for we know that emotional disorder will produce such a multiplicity of subjective symptoms as to simulate almost anything.

Mention of the compensation or litigation neurosis has been omitted purposely from this discussion, because such cases constitute a group in themselves, and are always terminated successfully by adjustment of compensation or ending the litigation. As such, they have no place in this presentation.

Turning our attention to the treatment of the functional nervous case, we enter a great field of endeavor which presents innumerable problems of detail, but which, nevertheless, is sponsored by definite and well-balanced principles. From the standpoint of treatment, these cases fall into two large groups:

1. Those not disabled as far as vocation is concerned.

2. Those so affected that they are no longer useful members of society, and are unable to follow their normal occupation.

General principles of treatment are the same in both groups but the details differ. It is with the severely affected type that we are chiefly concerned—those who are so out of adjustment, psychologically, that they can no longer earn a living or balance themselves emotionally so as to fill their normal place in life. To treat such a case successfully in the home or as an office patient is impossible. Surrounded by friends or relatives, the patient is unable to free himself from the emotional morass into which he has sunk, and anything the physician can do either in the office or by calling at the home is promptly neutralized by the home reactions. It is a waste of time to try such a procedure and can end only in disgust on the part of the doctor and failure on the part of the patient. Sending away on a trip rarely does good, for an individual overwhelmed by an emotional tornado in Minnesota or Wisconsin, is not going to be any different in California or Florida. It is no more possible to run away and lose this condition than it is to run away and leave one's shadow behind. The oft-repeated advice to the patient's family to "take him away on a trip and give him a good time" or to get a "change of scenery" is practically worthless from the standpoint of successful therapy. It may prove good in an occasional case, but usually not. The most common effect is to depress the patient more and to discourage the family, because they have tried something that they feel should have succeeded and did not.

The first step needed to insure success is to get the patient away from home and into a hospital or sanitarium. Here a neutral atmosphere can be established and the physician can secure perfect control of his patient and have his orders properly executed. The hospital atmosphere being impersonal and unemotional, offers the ideal field for relaxation and settling down to the business of getting well. The next step is to exclude family and friends and shut off telephone calls and mail. This usually involves an argument with the family as well as with the patient, for they cannot understand the reason for such restrictions. The wise and diplomatic doctor, however, will insist on having his way and will explain to the family that if they are going to the expense of hospitalization to get the sick one away from home, there really is no object in bringing the home to the hospital. Having secured the coöperation of all concerned in these two procedures, the battle is half won. From then on it is up to the doctor to sell himself to the patient and conduct a campaign of education which will result in recovery. This requires time: daily bedside visits, where often it becomes the doctor's job to sit and listen. Having gained the patient's confidence, it is amazing the mass of emotional débris which will pour out of his innermost self, if the physician will sit and listen. Finally comes the time when there is no more material to come and then we begin to see results. Feelings, sensations and experiences which have been repressed, often for years, are removed and the normal personality begins to return in all its buoyancy. Recovery is never rapid. It is usually a matter of many weeks or even months.

Convalescence is punctuated by frequent periods of depression, with return of old fears or the appearance of new ones. This discourages the patient but not the doctor, for these periods grow shorter, less severe and less frequent and there is a gradual and progressive trend towards recovery. With a firm and understanding hand the physician leads his patient, giving explanation and information as often as necessary, and never resorting to ridicule. Many of the most trivial anxieties need the most careful explanations, and under no consideration should the patient be allowed to believe that he is "silly" or "a fool." Ridicule and sarcasm have no place in the treatment of functional nervous cases, and if used will do positive harm and retard recovery, in addition to destroying the confidence of the patient in his doctor.

Physiotherapy, baths, massage and electrotherapy, with many forms of suggestive treatment, are all useful adjuncts. Attention to diet and personal hygiene, with proper regulation of body weight, are also in order. Drugs are given as little as possible, but are used where indicated, particularly to secure adequate sleep at night. Proper adjustment of rest and exercise, with various diversions such as games and occupational therapy, are always proper, particularly during the convalescent period. The hospital or sanitarium régime must be continued until recovery is complete enough to insure self-confidence, and absence of all the former troublesome symptoms.

The physician's personality and his willingness to take the necessary time, together with his ability to read and understand human nature, are the attributes that govern his success in treating the functional nervous case. An accurate diagnosis, a positive attitude, a forceful personality and a real interest in the case will in most instances produce the desired cure.

1068 Lowry Medical Arts Building.

LEUKOPLAKIC VULVITIS OR KRAUROSIS VULVÆ; ITS RELATION TO CARCINOMA AND ITS SURGICAL TREATMENT*

VIRGIL S. COUNSELLER, M.D.
Rochester, Minnesota

IT hardly seems possible that a disease that was so completely described fifty years ago, a disease which can be present for months or years on the genitalia of women and can produce itching, burning, ulceration, and occasionally can be associated with malignant disease, could still remain the subject of considerable difference of opinion. It does not seem that this disease has been given as much attention in recent years in the literature as its importance merits, although Graves and Smith reviewed the literature and outlined the various views held by gynecologists regarding the terminology and the clinical course of the disease. The five-year results in cases of leukoplakia vulvitis and carcinoma of the vulva recently given by Taussig leave one with scarcely a doubt regarding the correct treatment.

There has always been difference of opinion regarding the terminology of this vulvar disease, and its relation to malignant growth. Most authors have used the terms "leukoplakic vulvitis" and "kraurosis vulvæ" interchangeably, although a few have maintained that the two terms denote separate diseases. Berkeley and Bonney held to the latter view. They stated: "Leukoplakic vulvitis is a chronic inflammatory condition of unknown origin characterized in its early stages by marked hyperemia and cellular activity, and in its later phases by marked epithelial hypertrophy, and a thickened, sclerosed and retracted condition of the subepithelial tissue. The whole of the vulva may be implicated with the exception of the vestibule and orifice of the urethra, which are never affected. It may extend laterally to the folds of the thigh and posteriorly to the external perineum and the skin around the anus." The term kraurosis, which is extensively used in this country to apply to the condition just described, was rejected by Berkeley and Bonney, and was used by them to designate a condition which most gynecologists ordinarily regard as progressive sclerotic genital atrophy. Kraurosis, in the strict sense, as stated by Berkeley and Bonney, is an atrophic condition of the vulva associated chiefly with stenosis of the vaginal orifice and pathologically with certain changes in the dermis. It may involve all the surfaces of the vulva as far as the cutaneous borders of the labia majora, and the skin of the perineum and anal region. They regarded the loss of ovarian function, such as that in young, sterile women, and that following the menopause and surgical removal of the ovaries, as the main etiologic factors in kraurosis, although they admitted the influence of chronic inflammation.

Graves and Smith, from their histologic studies of eighteen cases, regarded leukoplakia vulvitis and kraurosis vulvæ as phases of an identical process, and advocated retaining the term kraurosis in its original sense as described by Breisky. Szàsz and Veit expressed the belief that kraurosis is an end-product of leukoplakia, that the two are different stages of an identical process, and that leukoplakia is a hypertrophic or progressive stage and kraurosis an atrophic or regressive stage. Taussig discarded the term kraurosis entirely and recommended that if it were used at all it should be applied to the simple form of vulvar atrophy, as advocated by Berkeley and Bonney, and that the name leukoplakia vulvitis be used to designate a disease commonly known as kraurosis. I favor the term leukoplakic vulvitis because it signifies the inflammatory nature of the disease. Furthermore, the process not only involves the vulva but may extend to folds of the thigh, perineum and perianal tissue; vulvar atrophy is usually confined to the vulva.

The etiology of leukoplakic vulvitis is not known. It is thought to be associated with chronic irritating vaginal discharge although this is not entirely correct, since patients have been seen who did not have a history of any irritating vaginal secretions. The average age at which the condition makes its appearance is usually in the fifth decade, but it has occurred as early as the thirtieth year and as late as the seventieth year. The average age as given by Berkeley and Bonney is fifty-one years, by Taussig as forty-nine years, and by Graves and Smith as fifty-five and six-tenths years. It is rarely seen in negresses. The civil state of the patient may have a direct bearing on the cause of the disease, since the highest percentage of women who suffer from leukoplakic vulvitis either are married or have been married. Parity does not seem to be a factor, since the number of cases seen in sterile women and in those who have had children are about equally divided. Disturbance of the ovarian function has been repeatedly emphasized in the literature, since practically all cases which have been observed and reported have occurred among patients past the menopause. In cases in which the disease was present before the climacteric the patients for years had had some abnormality of the menstrual function, although it was not always severe. Syphilis has no direct connection with the disease although it may be seen in conjunction with it. It may be said that leukoplakia vulvitis is an inflammatory disease due to some injury or interference with the physiologic activity of the surface epithelium of the labia. This disturbance may in the future be shown to be on a basis of vascular change and infection, since there is diminution of the number of blood capillaries and other blood vessels in the subcutaneous tissue and since the condition is always associated with chronic infection.

---

*From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Second Annual Meeting of the Central Association of Obstetricians and Gynecologists, Excelsior Springs, Missouri, October 11, 1930.

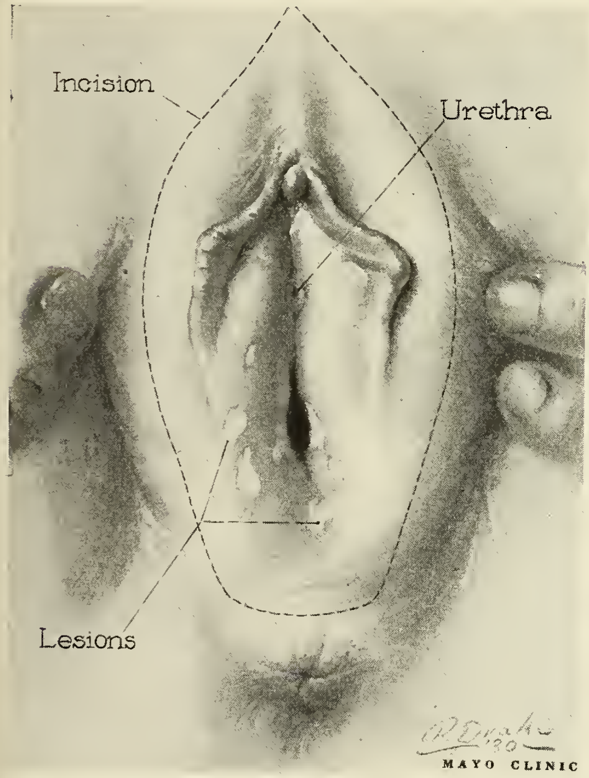


Fig. 1. Leukoplakic vulvitis, early stage, line of incision for simple vulvectomy.

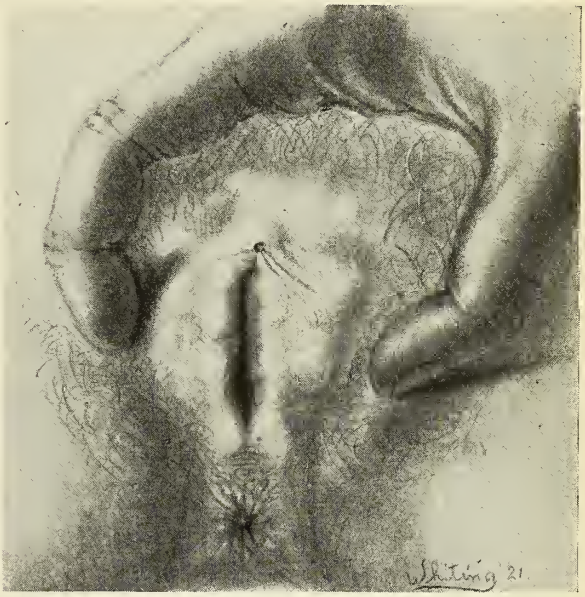


Fig. 2. Leukoplakic vulvitis, late stage. The labia minora are absent and there is marked contraction of the labia majora and partial stenosis of the introitus.

The most characteristic and predominant subjective symptoms are pruritus, burning on urination, and pain or acute sensitiveness of the vulva. The pruritus is of long standing and frequently is the only symptom for many years. It may be so intense that patients suffer from insomnia, for the pruritus is more severe at night. Dysuria is usually worse in the late stages of the disease, when the skin becomes excoriated from scratching. Objectively the vulva is at first reddened, and swollen, and the surface is dry and excoriated (Fig. 1). Later the labia minora decrease in size, become somewhat stiffened, and the color changes from red to white or gray (Fig. 2). The skin then may become cracked and ulcerated, may bleed easily when scratched and there may be a slight discharge on the surface. The ulcers are of various sizes and may be long, irregular or patchy. They may be covered with a pearly blue substance which can be wiped off easily and beneath which is seen a reddened, granulated area. The epithelium around the ulcers is hyperkeratotic and the base is hard and very sensitive to the touch. It is in this hypertrophic or progressive stage that malignancy is said to occur.

If malignancy does not occur, the disease progresses into an atrophic state with marked shrinking and retraction of the parts and stenosis of the vaginal orifice.

The histopathologic picture varies according to the stage in which the disease is seen. The excellent description given by Taussig, who is an authority on vulvar disease, can scarcely be improved. He stated that in the early stage there is seen extensive subepithelial leukocytic infiltration, with pronounced elongation of the epithelial papillæ, and beginning thickening of the keratin layer (Fig. 3). In this layer nuclear elements may be seen, and Taussig applied the term "parakeratosis" to this stage to distinguish it from the later hyperkeratosis, in which only thickly packed fibers of keratin can be seen. After several months, if the disease has been progressive, there is noted a marked increase in the thickness of the eleidin layer and in the amount of eleidin deposited in the cells; the layer appears as a dense black band beneath the keratin layer. The epithelium in the hyperplastic stage is several times thicker than it is in the normal state. There is considerable hyperemia and infiltration of the connective tissue with round cells. In the final or atrophic stage there is marked increase in the connective tissue, associated with sclerosis (Fig. 4). Gradations from the hyperplastic to the atrophic stage can be observed in the same sections, because the changing process is not abrupt. In the late stage there is seen increasing hyperkeratosis, an increased amount of eleidin, and reduction in the size of the epithelial papillæ. These become much flatter and shorter. There is diminution in the infiltration with round cells and increase in the sclerosis of the dermis. Briefly it may be said that in the late stage the epithelial layer consists of a deep layer of hyperkeratosis, beneath which is found a thin layer of eleidin cells, and then, with papillæ absent, a flat strip of pavement cells that may or may not be covered by a single layer of epithelium. The changes in the dermis are perhaps more characteristic. Here the infiltration with round cells is in more or less circumscribed lymphatic zones, which resemble lymph nodes. The infiltration is much less marked than in the early stages, and many plasma and mast cells are scattered through the connective tissue. The connective tissue now undergoes collagenous change, producing patches of glairy tissue in which may be seen but few normal cells (Fig. 5). There is diminution in the amount of elastic tissue between the epithelial papillæ of the skin, and directly beneath the basement membrane, even in the early cases; this absence of elastic fibers becomes increasingly pronounced as the disease advances to the late stage.

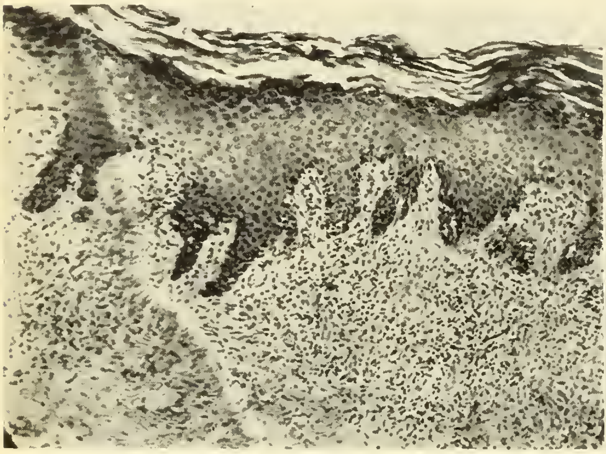


Fig. 3. Elongation of the epithelial papilla, subepithelial leukocytic infiltration and fibrosis with thickening of the keratin layer.

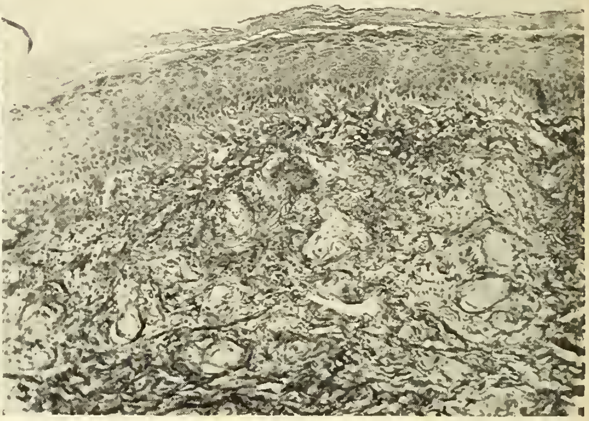


Fig. 4. Van Gieson's stain for connective tissue. Marked subepithelial fibrosis with strangulation of the blood vessels and infection.

RELATIONSHIP OF LEUKOPLAKIC VULVITIS TO MALIGNANT DISEASE

Leukoplakia in its broad sense, since the time of its description by Schwimmer, in 1877, has been regarded as a precursor of carcinoma. Berkeley and Bonney, and Taussig emphasized the tendency of leukoplakic vulvitis to undergo malignant change. Berkeley and Bonney stated that the relationship borne by leukoplakic vulvitis to carcinoma is closer than that of any other pathologic lesion, with the exception of roentgen-ray dermatitis. Mars, Szàsz, Butlin, Schmidt, Bucura, and others described what they considered a direct transition of leukoplakic vulvitis into carcinoma. Kraurosis with carcinoma was reported also by Jung, and recently by Gargert, who mentioned three stages: first, an atrophic kraurotic stage; second, a phase of atypical epithelial proliferation, and third, carcinoma. Smith made an intensive search of his sections in order to determine whether carcinoma developed on a basis of kraurosis as well as on a basis of leukoplakia, in view of the fact that Szàsz expressed the belief that kraurosis is the end-product of leukoplakia, and that kraurosis in its strictest sense represents an entirely obsolete process from which the development of carcinoma is improbable. Smith found that in all but two instances the matrix of the carcinoma was obviously leukoplakic. Taussig found, in a study of thirty-nine cases of vulvar carcinoma which was implanted on a leukoplakic base, that histologically in 60 per cent the malignant changes took place in an early hyperplastic area, and in 40 per cent in a late atrophic area. There seems to be, therefore, sufficient evidence that carcinoma can develop in either stage of the disease although its development is more likely to manifest itself in the hyperplastic or progressive stage. Since carcinoma does not develop in all cases of leukoplakic vulvitis, it would seem that there must be factors other than the leukoplakic process which initiate the malignant process.

Broders stated that leukoplakia is hyperkeratosis and is purely a defensive reaction of the corium; in other words that it is normal thickening of the skin caused by chronic irritation. It may be associated with infection but this depends on the part of the body that is involved. A typical example of hyperkeratosis is the ordinary callus on the hands or that on the soles of the feet. It is frequently seen on the lips of habitual smokers. The itching which develops is induced by infection in the subepithelial tissue. Infection is certainly more likely to occur around the genital and anal orifices, and, once it develops, there is accompanying pruritus of more or less severity which is directly proportional to the amount of infection. Following this there is subepithelial inflammation in addition to leukoplakia, which is aggravated by constant scratching. During the succeeding months or years after the onset a more extensive hyperkeratosis develops. This may spread to the cutaneous margin of the vulva, anal and perineal regions, and may be associated with ulceration and more infection. There is now hyperkeratosis, with thinning of the stratum germinativum and stratum mucosum; marked increase in the number of connective tissue cells, plasma cells, lymphocytes, and mast cells; few polymorphonuclear leukocytes, and decrease in the elastic tissue. This is the classic picture of healing by second intention and scar formation. Katsurada considered this a sign of degeneration, and Frieboes considered it a process of healing by irritation.

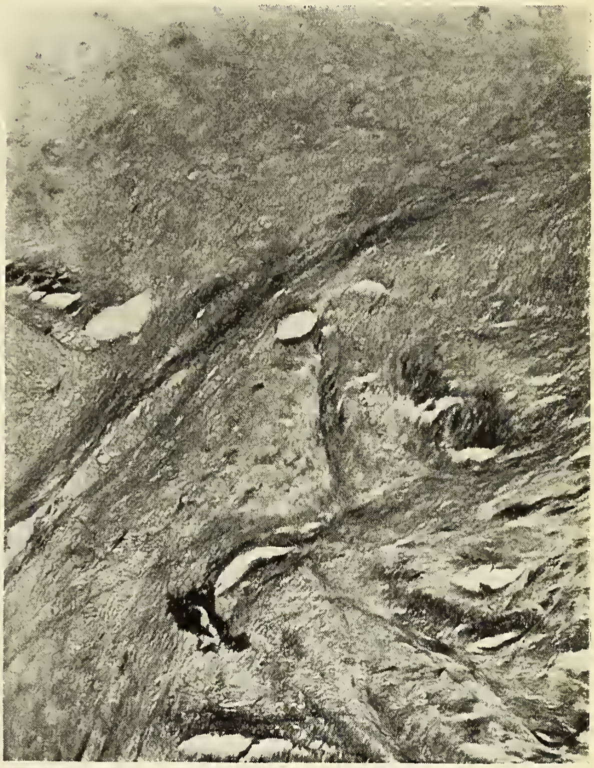


Fig. 5. Late stage. Connective tissue developing collagen, which is a normal protective process. Absence of infection and blood vessels may be noted.

From the onset until the final stage of the disease the most characteristic picture is one of constant increase in connective tissue and decrease of elastic tissue, with strangulation and disappearance of blood vessels, which ultimately ends in atrophy. These same changes may be compared to those seen in portal cirrhosis in which there is (1) infection around the portal spaces, from moderate to severe degree; (2) a deposit of connective tissue around the blood vessels and bile ducts, associated with atrophy of the hepatic tissue, and (3) strangulation of the blood vessels, and scar formation.

In leukoplakic vulvitis there is a moderate degree of activity or regeneration of the stratum germinativum and stratum mucosum which is characterized by extension downward of the epithelium in a papillary manner; this process may be marked, but it is benign. However, this regeneration is not as pronounced as the regeneration of the connective tissue. As the connective tissue increases, a process of retraction and scarring is initiated, together with diminution in the infection. Pruritus then becomes less severe and the disease is said to be quiescent.

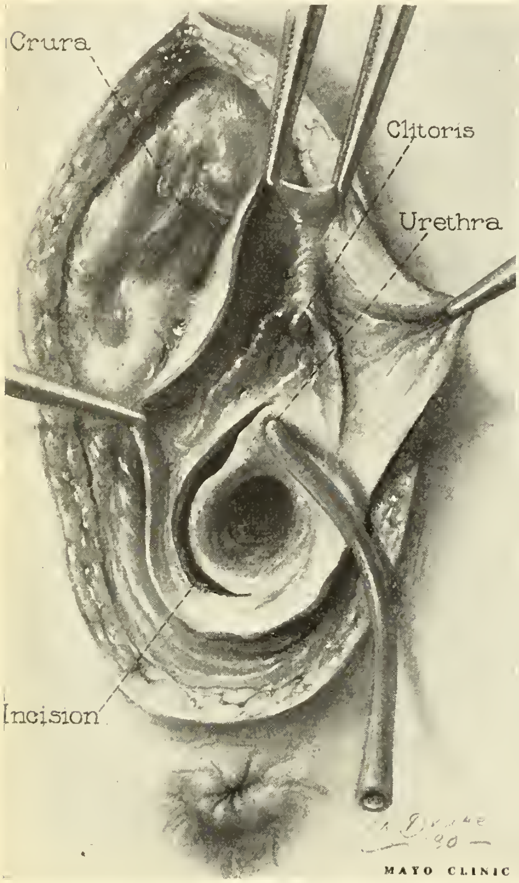


Fig. 6. The inner incision extends around the vaginal orifice at the mucocutaneous juncture and passes anterior to the urethra, thus preserving this structure. The outer incision is completed. The labia majora and minora and the clitoris are removed en masse.

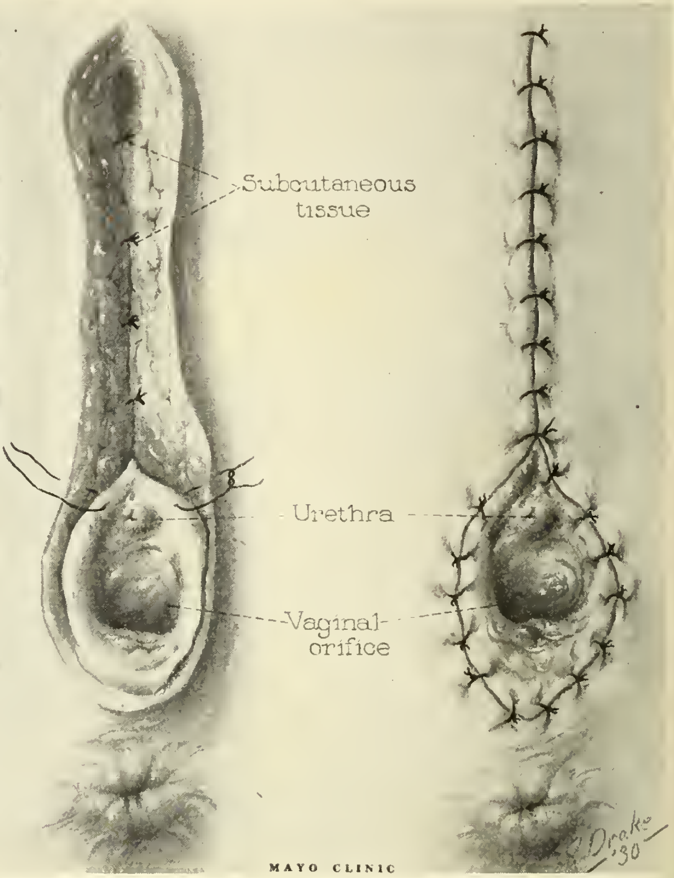


Fig. 7. Closure of the skin and subcutaneous tissue.

In a consideration of the relationship which this disease has to the development of malignant change in the vulva, I believe that all statements must be made with reservation. It is true that epithelioma is seen with leukoplakic vulvitis, but the malignant process usually is the predominant picture. On the other hand, there are epitheliomas of the vulva with little, if any, leukoplakia, and, again, approximately 50 per cent of the cases of leukoplakic vulvitis terminate in complete atrophy of the vulva and stenosis of the vagina. Rentschler, in a review of seventy-one cases of primary epithelioma of the vulva seen at The Mayo Clinic between 1907 and 1927, found that in 40 per cent the patients gave a definite history of preëxisting pruritus but that in only five cases were both leukoplakia and malignant change found pathologically. This, however, cannot be accepted as absolutely correct because a high percentage of the patients had been subjected to various methods of treatment for pruritus, such as ultra-violet light, radium, roentgen rays, and partial excision, before they came to the clinic. Such procedures unquestionably change the histologic picture.

It seems unlikely that the development of carcinoma in a vulva, previously the seat of leukoplakic vulvitis, is the direct consequence of a chronic inflammatory process. If leukoplakia is a precursor of carcinoma of the vulva, then malignant lesions should develop in varicose ulcers and in lesions of blastomycosis, since the same type of epithelium is involved, but they practically never do develop on a basis of such lesions. Carcinoma does not develop in all cases of leukoplakic vulvitis; moreover, carcinoma of the vulva occurs without leukoplakia. These facts seem to indicate that the cause of carcinoma, which accompanies leukoplakia, is not irritation.

Carcinomas of the vulva are, as a rule, slow in growth, and approximately 80 per cent are graded 1 or 2. The epithelial cells are differentiated and produce keratin which tends to hold the malignant process in check. There is also increase in the connective tissue stroma as a consequence of chronic infection. This may explain why the histologic picture resembles leukoplakia or kraurosis. Furthermore, it is rare to find kraurotic changes in a malignant lesion of the vulva graded 3 or 4, because it is developing too rapidly.

TREATMENT

The treatment of leukoplakic vulvitis in the early stages has always been directed toward eradicating the pruritus. This has been done by applying nonirritating emollients, salves, roentgen rays and radium. Most of these agents have only a temporary effect, but roentgen rays and radium often stimulate the disease or may produce a burn. If a malignant lesion is not present the ideal treatment would be obtained by sectioning the internal pudic nerve, thereby anesthetizing the vulva and permanently relieving the pain and pruritus. This procedure was first suggested by Simpson of Edinburgh, in 1861, for vaginismus; it was used, also, by Rochet, in 1899, and again in 1903, in the treatment of painful spasm of the posterior urethra and later in the treatment of pruritus vulvæ. Albertin, in 1903, used it in certain types of painful cystitis; Tavel, in 1902, used it against vaginismus and pruritus vulvæ.

Wertheimer and Michon performed this operation in two cases of vaginismus, in two cases of kraurosis vulvæ and in one case of epithelioma of the vulva. The relief from pain was permanent in the cases of vaginismus and kraurosis, and it was satisfactory in the epithelioma of the vulva. It would seem logical, therefore, in cases of leukoplakic vulvitis, if the ulcerations are not malignant, to advise section of the internal pudic nerve, since it would give permanent relief from the symptoms which make life miserable. Learmonth, of The Mayo Clinic, has performed this operation with very satisfactory results.[14]

Following this operation the patient should be submitted to careful examination at least twice a year, and if there is any question of the presence of a malignant lesion, simple vulvectomy (Figs. 1, 6 and 7) should be performed in cases in which the malignancy is graded 1 or 2. If the malignancy is of a higher grade or if there is lymphatic involvement in a case of malignancy of lower grade, radical vulvectomy with bilateral dissection of the gland-bearing area should be performed after the method of Basset. If the condition of the patient in whom malignancy is found does not justify radical removal, then it would be well to section the internal pudic nerve, and to use radium, as palliative measures.

SUMMARY

Leukoplakic vulvitis is a disease of unknown origin and usually becomes manifest after the menopause. It is a progressive process, lasts for months or years, is characterized by hyperkeratosis, chronic infection and subepithelial fibrosis, and terminates in atrophy of the vulva or it may be associated with malignancy. The relation of leukoplakic vulvitis to carcinoma is not definitely known and will be solved only when the cause of carcinoma is discovered. The treatment in the early stage should consist of section of the internal pudic nerve. In the later stage, if a malignant growth is suspected, vulvectomy should be performed.

BIBLIOGRAPHY

1. Albertin, M.: Résection de nerfs honteux internes. Lyon méd., 100:572-574 (March), 1903.
2. Berkeley, Comyns, and Bonney, Victor: Leukoplakia vulvitis and its relation to kraurosis vulvæ and carcinoma vulvæ. Proc. Roy. Soc. Med. (Obst. and Gynec. Sect.), pt. 2, 3:29-51, 1909-1910; Brit. Med. Jour., 2:1739-1744, 1909.
3. Breisky: Quoted by Graves and Smith.
4. Broders, A. C.: Epithelioma of the genito-urinary organs. Ann. Surg., 75:574-604 (May), 1922.
5. Broders, A. C.: Personal communication.
6. Bucura, C. J.: Leukoplakie und Karcinom der Vulva; Totalexstirpation mit Drüsenaursrämung.

Uterus myomatosus hypoplasticus mit Achsendrehung. Wien. klin. Wchnschr., 25:616-620 (April), 1912.

7. Butlin, H. T.: Leukoma or leukoplakia of the vulva and cancer. Brit. Med. Jour., 2:61-62 (July 13), 1901.
8. Frieboes, W.: Kraurosis vulvæ. Dermat. Ztschr., 55:345-355, 1929.
9. Gargert: Quoted by Terruhn, E.: Kraurosis vulvæ. Arch. f. Gynäk., 134:578-602, 1928.
10. Graves, W. P., and Smith, G. V.: Kraurosis vulvæ. Jour. Am. Med. Assn., 92:1244-1252 (April 13), 1929.
11. Jung, P.: Die Ætiologie der Kraurosis vulvæ. Ztschr. f. Gerburtsh. u. Gynäk., 52:13-29, 1904.
12. Katsurada: Quoted by Frieboes.
13. Mars, V.: Ein Beitrag zur Kraurosis Vulvæ. Monatschr. Geburtsh., 7:616, 1898.
14. Mueller, Selma C.: Leukoplakic Vulvitis. Proc. Staff Meet. Mayo Clinic, 6:5-9 (Jan. 7) 1931.
15. Rentschler, C. B.: Primary epithelioma of the vulva. An analysis of seventy-one cases. Ann. Surg., 89:709-730 (May), 1929.
16. Rochet, V.: Traitement chirurgical des prurits périnéaux, anaux et vulvaires. Lyon méd., 100:570-572 (March), 1903.
17. Schmidt, H. R.: Wiederholte Karzinomentwicklung auf leukoplakischer Grundlage. Ztschr. f. Geburtsh., 83:736-749, 1921.
18. Schwimmer: Quoted by Terruhn, E.: Kraurosis vulvæ. Arch. f. Gynäk., 134:578-602, 1928.
19. Simpson, A. R.: Painful muscular and fascial contractions along the vaginal canal. Edinburgh Med. Jour., 7:594 (Dec.), 1861.
20. Szàz, Hugo: Quoted by Graves and Smith.
21. Taussig, F. J.: Leukoplakic vulvitis and cancer of the vulva (etiology, histopathology, treatment, five-year results). Am. Jour. Obst. and Gynec., 18:472-503 (Oct.), 1929.
22. Tavel, E.: La résection du nerf honteux interne dans le vaginisme et le prurit de la vulve. Rev. de Chir. 25:145-163, 1902.
23. Veit, J.: Quoted by Graves and Smith.
24. Wertheimer, P., and Michon, L.: La névrotomie du nerf honteux interne; indications, technique, résultats. Jour. de Chir., 31:497-509, 1928.

O. W. LILLY'S SOLUTION, DENTAL

From an examination made in the A. M. A. Chemical Laboratory it is quite likely that the preparation contains potassium mercuric iodide and an arsenic compound, such as "Solution of Potassium Arsenite U.S.P." (Fowler's Solution). The product is apparently prepared by one Dr. O. W. Lilly of Welch, West Virginia. It is recommended by the proprietor for Vincent's infection and all other acute, infectious, ulcerative conditions of the gums and oral mucosa, infected sockets, and pyorrhea. It is a pity that a mixture of such potent ingredients may be dispensed under a proprietary name to the patient for pathologic conditions of the oral cavity. If a dentist or a physician desires to have his patient use a solution containing a mercury or an arsenic compound, it should be prescribed according to the individual needs, with full appreciation on the part of both prescriber and patient of its poisonous character. (Jour. A. M. A., February 21, 1931, p. 634.)

VITAGLASS

Vitaglass is the trade name for one of many patented ultraviolet transmitting mediums that pass ultraviolet radiations more or less freely. A Bureau of Standards report states that vitaglass of 2.3 mm. thickness has, at a wavelength of 3,020 angstrom units, an average transmitting efficiency of nearly 25 per cent. More recent tests place the efficiency at 42 per cent. Other tests have given an efficiency of 47 per cent. The improvement in the manufacture of the product may account for these varying results. The product varies widely from batch to batch. The purchaser of vitaglass should protect himself by contracting with the dealer to furnish glass where transmission shall, after stabilization of exposure, not fall below the efficiency stated. A recent test gave no indication that children attending school in rooms glazed with vitaglass were perceptibly improved over those children who attended rooms glazed with ordinary glass. (Jour. A. M. A., February 28, 1931, p. 711.)

NON-SPECIFIC VAGINITIS*

William H. Condit, M.D.
Minneapolis

THIS presentation is the result of a study of the records of 230 patients selected from among 43,000 registrations at the Nicollet Clinic of Minneapolis, Minn., upon whom the diagnosis of acute, subacute, or chronic non-specific vaginitis was made. The vagina is provided by nature with certain defenses protecting the peritoneum from infection by way of the uterine canal, the entrance to which may or may not be closed to outside invasion. The chief defense of the vagina is a secretion which, if normal, is destructive to ordinary invading bacteria, and tends to protect the vaginal wall as well as the cervix uteri from infection. Anything that contributes to reducing the natural resistance of this defense, or the nutrition of the vaginal wall, interferes with the protective forces of the vagina and predisposes it to invasion and infection.

Incidence.—It is suggested to the writer that there are many more patients suffering from vaginitis than were encountered ten or fifteen years ago; that is, more in proportion in the aggregate of patients seeking gynecological treatment. Whether the modern dress, mode of living and motor travelling has anything to do with increasing avenues of infection, or whether it is a coincidence of an individual observation, would be difficult to determine. Perhaps prophylactic teachings relative to cancer have brought many to the examining room who otherwise would not have come under observation.

Age.—The youngest of this group of 230 was seven months old; the oldest 78 years. The majority, however, ranged from eighteen to forty, and included unmarried virgins, unmarried individuals who had indulged in sexual intercourse, and married women who had borne one or more children.

Etiology.—The cause of acute, subacute, or chronic vaginitis is usually of bacterial origin; the flagellate trichomona vaginalis also is a common causative agent. The inoculation may be from external contamination or internal systemic infection. The external causes may be trauma, primarily, with an infective process superimposed; infection from the dirt of the streets; soiled douche points; mechanical abuses; accidental inoculation from imperative nursing of anal or rectal afflictions; neglected hygiene; dirty vest pocket or shop soiled condoms, and many less common avenues.

Some no doubt may have existed since infancy and been unnoticed or neglected, lying semi-dormant for years, and fanned into activity in later life, or become more virulent because of lowered general physical resistance from some other disease. If infection by chance invades the vagina one or two days before the actual flow of the menstrual period, when there is a small amount of serum or blood present, a very favorable medium is present for a rapid growth and spread of the infection to the whole vaginal wall. Again, an acute attack may be quite healed with a very few bacteria lying dormant in a fold, mucous cell or gland, when the menstrual flow appears, and a very acute exacerbation will result. It is with apology that I mention focal infection as a possible source of infection, primarily, or secondarily, for nearly all ailments which the human being is heir to are blamed on the much expounded theory of focal infection. However that may be, I have seen rapid recovery take place when the general physical economy has been strengthened by removal of infected tonsils, teeth and appendix. We know the cervix uteri is a highly resistant part of the female anatomy, provided with rich vascular supply, nature having anticipated its receiving much abuse in life. However, we do have definite infections of the cervix and cervical canal resulting from trauma, and infection of its glands from systemic infection above or below. These infections become masked and encapsulated, hidden from external identification, but may act as a store-house of bacteria to pour out infection to the less resistant, weakened vaginal wall. We know that the vagina is a bacterial haven practically from the time of birth. Because of the proximity to the home of the colon bacillus and its numerous relations, that organism is usually found in the vagina. If the colon bacillus secures the upper hand, however, there is no more unpleasant non-virulent organism known as a cause of a most foul-smelling, irritating, profuse vaginitis. Many types of bacteria may be identified in the vagina that has suffered an attack of bacterial invasion, or in a subacute or chronic cervicitis. I have made many attempts to isolate specific organisms without success; in one patient we isolated three unidentifiable organisms from which I made a vaccine, but in general its use was very usatisfactory and discouraging.

---

*From the Department of Obstetrics and Gynecology of the Nicollet Clinic, Minneapolis, Minn. Read before American Association of Obstetricians, Gynecologists and Abdominal Surgeons at Niagara Falls, Ontario, September, 1930.

Pathology.—The gross appearance of the introitus vagina in any type of infection is usually an extremely congested mucosa bathed in a purulent or muco-purulent discharge which usually contains many gas bubbles. The meatus urinarius may be congested and will bleed on the slightest mechanical irritation. The vaginal wall may present the appearance of a congested mucosa, the color and appearance of a very red strawberry with minute bleeding points that give a brown or yellow color to the discharge. Again, the vaginal walls might be compared to a very ripe raspberry, not so bright a red as the "strawberry" type, but with papillary elevations over the entire surface. Not infrequently the inflammation extends over the surface of the cervix uteri and into the cervical canal. It is quite possible, where this condition is present, that the endocervicitis is the primary seat of infection, the process originating from above the canal rather than from without inward. When this situation is encountered, we may have a so-called erosion which will resist therapeutic measures much more than the disease of the vaginal wall, for we have then to deal with a new cell formation resulting from the proliferation of the lymphoid tissue within the cervical canal.

If the vaginitis or cervicitis, or both, have existed for some months, or in many cases for years, we have a hyperplasia of the connective tissue resulting with occlusion of the glands and small cysts developing which add to the discharge pouring from the vaginal mucosa. The cervix then may become hypertrophied to several times its normal size and the vaginal mucosa may also appear much hypertrophied. Abscess formation may occur, but not very frequently.

Pelvic manifestations may be found in thickened tubes and parametrium, especially if the source of infection primarily should be a salpingitis, metritis, or endometritis. An ascending lymphangitis may cause a definite pathology in the ovaries, but it is difficult to estimate just how much this pathology can be traced to an ascending lymphangitis.

Symptomatology.—In forty patients of this series, the trichomona vaginalis was found. The vaginal discharge in patients who suffer from invasion of the above flagellate is very characteristic, has an amber color, a peculiar "burned rag" odor, and is full of tiny gas bubbles. The microscopic examination easily identifies this type and it is very amenable to treatment.

The chief symptoms are a profuse vaginal discharge, usually of an unpleasant or foul odor. The color may be yellow, yellow-greenish, amber or actually bloody. The introitus may be deeply injected and very tender; the skin of the external genitals and legs may be reddened and painful from exposure to continued moisture. The patient may complaint of loss of weight, heavy bearing down sensation in the lower abdomen, general malaise, or even an anxiety neurosis. If the affliction has extended over a period of months or years, there may be bladder symptoms, frequent and painful urination. Constipation may be an accompanying condition, requiring lower bowel therapy and treatment which only adds additional hazard to the vaginal condition, in that additional anal toilet increases chances of contamination of the vagina.

Treatment.—The therapy to select in the treatment of vaginitis will depend upon the age of the patient and the nature of the infection. I treat an infant suffering from an acute vaginal infection by injecting 3 per cent mercurochrome in melted lanolin through a catheter into the vagina, completely filling it, and the patient is confined to bed for forty-eight hours with a tight napkin over the vulva. Nearly as satisfactory results may be obtained by filling the vagina with a 20 per cent solution of arygyrol, or, if the hymenal ring is not too small, by packing the vagina full of a soft gauze strip saturated in 15 per cent argyrol. The patient in either case is confined in bed, and the position is changed so that the solution in the vagina comes in contact with the entire surface of the vaginal wall. In the adult, the secret of treating any infection of the vaginal wall is in exposing the entire surface to the agent employed, obliterating all folds, rugæ, and exposure of all glands. This can be accomplished by packing the vagina full of wool tampons (gauze and cotton is absolutely worthless), thoroughly saturated with the antiseptic agent chosen. The packing should be so tight that the patient will choose the bed for comfort. Our choice of antiseptics has been ichthyol compounds, or mercurochrome solutions and emulsions for the general run of bacterial infections.

The forty patients upon whom a diagnosis of trichomona vaginalis was made were treated either by the "soap alkali" treatment or the "drying-glycerine" method. Greenhill,[2] Davis[1] and Mathieu[3] have so recently provided us with such valuable monographs on this flagellate that anything I might add would be superfluous. The following is the writer's routine method which has given such satisfactory results that I am yet to be convinced of a better method. The whole vaginal wall is dried with gauze, then with an air blast. The vaginal wall is then swabbed with a 10 per cent mercurochrome solution and packed tight with wool tampons saturated with equal parts of glycerine and ichtholdine. Patients are instructed against re-contamination from the anal region, as follows: Never allow a menstrual napkin to slip forward, exert great care in inserting the douche point, and also be careful at intercourse that no organisms be forced into the vagina. Finally, since the usual result of one treatment is immediate relief and since the trichonoma grows rapidly in human blood serum, I instruct the patient on the importance of a vaginal treatment two days pre-menstrual, and two days post-menstrual. My results have been most encouraging.

Remarks.—Careful study of the histories of this series convinced me that twenty-five of the 230 patient (10.8 per cent) suffered from trichonoma vaginalis but were unrecognized. The patients in this group were registered before the year 1924. Our first laboratory report of trichomona findings was in 1921. They were found in dark field examination, accidentally, and were not considered a cause of any pathology.

Records of 65 (28 per cent) of the 230 patients contained definite history of existing focal infection—alveolar, tonsillar, sinus, gallbladder, cervix, appendix, or tubal in the order named. In this series 73 per cent complained of a vaginal discharge on the first visit; the others were discovered in the course of the study of other symptomatology. Eighty-eight, or 38 per cent, were unmarried. Two patients afflicted with trichomona were near the end of third trimester of pregnancy.

BIBLIOGRAPHY

1. Davis, Carl H.: Am. Jour. Obst. and Gyn. (Aug.), 1929.
2. Greenhill, J. P.: Am. Jour. Obst. and Gyn. (Dec.), 1928.
3. Mathieu, Albert: Northwest Med. (Jan.), 1930.

NO QUARANTINABLE DISEASE IMPORTED INTO UNITED STATES IN 1930

No instance of the importation into the United States of any quarantinable disease from abroad occurred during the past year. This fact was recorded in a report recently submitted to Congress by Surgeon-General Hugh S. Cumming of the United States Public Health Service. Immunity from such diseases was attributed not only to the system of control at domestic ports but also to the system of medical inspection maintained at foreign ports from which such diseases are likely to spread.

An outbreak of cholera in the Philippine Islands in May, 1930, became so serious that a maritime quarantine against the Islands was established as a means of protection against the transmission of infection, particularly through Oriental steerage passengers to the Hawaiian Islands and the Pacific coast ports of the United States.

Introduction of epidemic cerebrospinal meningitis from Oriental ports was effectually controlled by the continuance of special regulations, prescribed last year, governing the transportation of passengers from such ports to the United States.

The system of medical examination of prospective immigrants in the country of origin, now in effect in the principal European countries, has proved so satisfactory that it is proposed to extend it to other foreign nations.—*Health News,* Mar. 9, 1931.

DIAGNOSIS OF HERPES ZOSTER OPHTHALMICUS*

WALTER H. FINK, M.D., M.S., F.A.C.S.
Minneapolis

HERPES zoster ophthalmicus is an affection of the first division of the trigeminal nerve. It manifests itself by severe neuralgic pain and vesicular formation along the terminal twigs of the nerve supplying the skin of the forehead and ocular structures.

The condition calls for special attention because of the following reasons: it is not rare, it frequently presents diagnostic difficulties which may lead to confusion, and its eye complications may be disastrous. These points are brought out in the three cases presented in this paper. It is also important to emphasize that these cases do not, as a rule, come to the oculist first, but to the family doctor, and the responsibility of diagnosis may rest upon his shoulders.

In general the course is as follows: It is usually seen in people past middle age and begins without apparent cause. Violent neuralgic pains in the eye and forehead precede by several days the appearance of the herpes. The skin is very sensitive and the pain can be controlled only with great difficulty.

After a period of time varying from several hours to days, the skin of the lids and of the forehead becomes red and swollen and upon this area the vesicles appear. The vesicles may be arranged in groups or may be uniformly distributed. They most frequently occupy the region of distribution of the first branch of the trigeminal nerve supplying the upper lid and forehead. It is a characteristic feature of this condition that the affection is almost always confined to one side and does not extend beyond the midline of the head. All of the vesicles may be formed at once, but sometimes they appear in successive crops.

The next step in the course of the condition is that the serous contents of the vesicles become cloudy, then purulent, and finally dry into crusts. This process requires several days, so the period of eruption takes in all about three weeks. As the loss of substance caused by the formation of vesicles extends into the corium, scars are usually left, from the character of which it can long be recognized that the patient has suffered from an attack of herpes zoster. Herpes zoster gangrenosus is produced in rare cases by the spreading of the ulcers in consequence of secondary infection.

The serious aspect of the affection is due to the eye involvement which accompanies it. There is an increased sensitiveness to light and an increased flow of tears. The conjunctiva is affected and vesicles may appear upon it. The cornea may have herpetic eruptions which break down, leaving ulcers, and if they become infected, serious consequences may result. In other cases deep infiltrates develop which may be permanent. Through the paralysis of the trigeminus a neuroparalytic condition of the cornea develops in which there is an absence of sensation on the cornea. An iritis or iridocyclitis may be associated with corneal disease or be independent, and, if not cared for, synechiæ and other disastrous results may follow. Other less frequent findings are scleritis, optic atrophy, lowered intraocular tension and paresis of the abducus and ocular motor nerves which result in defective ocular movement.

Herpes zoster ophthalmicus may lead to difficulties in diagnosis. It may be confused with erysipelas, supra-orbital neuralgia, frontal sinus disease, orbital abscess, migraine headaches, glaucoma, iridocyclitis, ulceration of cornea, and conjunctivitis.

Erysipelas may be considered because of the swollen and reddened condition of the skin and because the lymph-nodes near the ear are swollen; but the arrangement of the vesicles, the fact that the medial line is rarely, if ever, passed over, along with the neuralgic pains, immediately indicates the diagnosis of herpes.

Supra-orbital neuritis is suggested because of the intense pain and is differentiated from herpes because of the lack of redness, swelling of the skin, and later by absence of eruptions and eye symptoms as seen in herpes.

Frontal sinus disease can be diagnosed by the nasal symptoms and findings of acute infection, obstruction, and discharge. The sinus may be cloudy on transillumination or X-ray and relieved by suction. The pain is of a different nature—a pressure pain.

---

*Presented at Asbury Hospital Staff Meeting, Minneapolis, September, 1929

Migraine usually has a history of previous attacks and may be preceded by an aura, may not be unilateral and the pain may extend to the base of the head. There is an absence of redness, swelling, and eruption on the skin.

Glaucoma in the acute stage presents difficulty in diagnosis. In glaucoma the eye symptoms overshadow everything. The pain is intense, the globe extremely tender, the pupil partially dilated and oval, the vision is nil, the congestion of the eye is venous, and the reflex from the pupil greenish.

Iritis due to other causes than herpes zoster may be confused with the iritis of herpes zoster. The diagnosis is not difficult as the pain is not so intense nor so widely distributed. The skin is not affected and it is more gradual in onset than the iritis due to herpes zoster.

Ulcer of the cornea may lead one to think of herpes, but when not associated with it, the pain is not so intense and the cutaneous area not involved. The cause is usually evident.

Conjunctivitis may be extremely painful and cause the lids to swell. However, the presence of pus and the appearance of the conjunctiva are diagnostic.

This very briefly covers some of the conditions which should be thought of when making a diagnosis of herpes zoster ophthalmicus. Herpes can usually be diagnosed at an early stage by elimination.

The following cases emphasize in a more concrete way some of the diagnostic difficulties encountered and complications which may arise. Only the essential facts are mentioned.

Case 1.—The patient was a woman seventy-two years of age, who, previous to the attack, had been in good health. One afternoon she experienced a sense of discomfort in the region of the left eye. This progressively increased in degree and became so intense by evening that a physician was summoned. Local measures were of no avail and when examined a few hours later the patient was in agony and complained of a sharp knife-like pain in the eye and shooting to the forehead. The pain was somewhat lessened by morphine. Examination revealed the lids of the left eye swollen and red, the conjunctiva hyperemic, the eyeball deeply inflamed, the cornea clear, and the pupil rather sluggish in action. The picture suggested most an iridocyclitis, orbital abscess, frontal sinus, or an acute glaucoma. No secretion was present and the tension normal. The picture remained the same for two days and then a reddening and swelling of the skin of the forehead appeared and was sharply limited to the left side. A few hours later vesicles made their appearance, distributed over the forehead and upper lid. The cornea showed several small vesicles which ruptured shortly after, causing ulceration. In spite of all precautions these became infected to a slight degree. The healing process and neuralgic pains continued for months intermittently. The corneal opacities were superficial and gradually disappeared.

This case illustrates the intensity of the onset and the difficulty in early diagnosis. The patient was seen before the eruption and at that time, with only the symptoms of frontal pain and congestion of the eye, it was necessary to differentiate between herpes, glaucoma, supraorbital neuritis, migraine, frontal sinus infection, iritis or iridocyclitis, corneal ulcer, conjunctivitis, and orbital abscess.

Case 2.—The patient was a male sixty-two years of age, with a past history which was not significant. The process started in the usual way with severe ocular pain shooting to the forehead. Because of the redness of the eye the condition was treated as an acute conjunctivitis. As it did not seem to improve, the patient decided to consult the writer. Examination at this time showed an acute iritis with the iris bound down over the pupil area. The vision was almost abolished in the eye and this was of serious importance because the other was blind (an old chorioretinitis). There was no evidence of eruption at this time, which was two days after the onset. Shortly after this, the eruption appeared. By injecting atropine and scopolamin beneath the conjunctiva close to the cornea, the synechiæ were broken enough so that a clear pupil was obtained. The case went on to an uneventful recovery with normal vision, although he still complains at times of knife-like pain in this region.

This case illustrates how a mis-diagnosis may be made and the eye be seriously endangered. The case was not recognized as herpes, the iritis which developed was overlooked and posterior synechiæ developed. This was especially important because the other eye was blind.

Case 3.—The patient was a female, aged 67, who had been in good health. The onset of the condition was not unusual and the usual redness and irritation of the eye appeared after a few days. Complications did not appear until after the eruption, when a cloudiness of the cornea in the central area was noted. This was a deep infiltrate of marked density. No ulceration developed. When seen by the writer the condition had existed several months. There was no improvement on treatment.

This case illustrates how the cornea may become affected without ulceration, resulting in an opacity which may permanently damage the vision.

SUMMARY

Herpes zoster is seen frequently enough in practice to warrant special attention. The condition in the early stage presents difficulties in diagnosis. Disastrous results may follow if the condition is not recognized, because eye complications which develop may lead to serious results if not treated early. The cases presented emphasize this statement.

1937 Medical Arts Bldg.

THE ECONOMIC IMPORTANCE OF SQUINT IN CHILDREN AND ITS EFFECT IN AFTER YEARS*

Frank N. Knapp, M.S.Ophthal., M.D.
Duluth

THE early diagnosis and treatment of incipient tuberculosis has markedly reduced the disability of this disease. The early diagnosis of cancer is the most effective means of saving the life of the patient. The early diagnosis and treatment of squint is equally important if the vision of both eyes is to be preserved. It is very discouraging to see a young adult for the first time and admit that he is beyond the age where it is possible to restore the vision of his crossed eye. With early training the vision in both eyes is retained and the physician and mother are both amply rewarded in being able to send the child into the world with two seeing eyes.

Binocular single vision is the result of fusion of two separate images by the brain centers. Diplopia is the production of two separate images that cannot be fused. Diplopia causes discomfort to the individual. Patients with squint do not complain of diplopia because there is a mental supression of the image from the deviating eye. In all cases of squint, fusion of the image is suppressed for the comfort of the individual. After the suppression of fusion has gone on for a period of time it becomes permanent, with the result that the deviating eye is functionally blind. This loss of vision of one eye is the fundamental question for consideration. Parents are concerned chiefly with the cosmetic result of squint, which is secondary in comparison to the loss of vision. Many parents are astounded as they follow the examination of the child and learn that he has but one useful eye.

Amblyopia of a true congenital type is not the rule. Birth injuries may produce macula lesions with the loss of vision and deviation of one eye. The greatest loss of vision is usually found in cases of convergent squint. In divergent squint there may be a partial loss of the vision of one eye; while in the alternating type the vision is usually equal in both eyes and may be normal.

Worth has tabulated the final visual acuity, after all possible means had been used to improve it, of the deviating eye in 985 cases of constant unilateral convergent squint (Table 1). This summary indicates that squint is not congenital. He has demonstrated that improvement of this defect is possible when the patient is seen before the power of fusion is lost.

Important factors of squint include the age of onset, whether it is the result of an illness or heredity. Many times we will be able to discover visual defects of one eye in either the father or mother. It is true that many cases of squint follow an illness, as measles, chicken-pox or scarlet fever, in which the general health of the patient has been impaired.

All cases of constant squint should be examined for any possible refractive error. No manifest refraction is possible in small children. All cases must be examined objectively after the instillation of atropine for at least three days. For cases of convergent squint nearly a full correction is prescribed. The majority of these patients are far sighted and the use of glasses readily improves the visual acuity. The use of atropine is the essential factor in the examination. It is the author's rule to prescribe glasses for all of these patients as soon as the patient is able to walk. If no improvement is manifest within six months glasses alone will not relieve the squint. The treatment of any squint case is never ended by the prescribing of glasses. Often we see older children who have worn glasses since they were one to three years of age and they later come in with one blind eye and the parents are under the impression that they have done all that is necessary because they have not been instructed otherwise.

There are several ways of improving the vision of the squinting eye. Atropine instilled in the seeing eye paralyzes the accommodation and theoretically compels the patient to use the squinting eye. On the other hand in many cases the vision of the eye under atropine is still better than in the squinting eye and the purpose of the treatment is lost. Sometimes the glass over the straight eye is frosted. This form of treatment usually results in the child removing the glasses and defeats its purpose. The most effective way

---

*Presented at the annual meeting of the Minnesota State Medical Association, Duluth, July 15, 1930.

TABLE 1 (Worth)

	20/20	20/30 to 20/40	20/50 to 20/70	20/100 to 20/200	Less than 20/200	Fixation lost irrecoverably
Cases seen first when the patient had squinted constantly during less than one-eighth of his or her life.	165	17	9	2	0	0
Cases seen first when the patient had squinted constantly during more than one-eighth and less than one-half of his or her life.	73	61	28	14	5	7
Cases seen first when the patient had squinted constantly during more than one-half of his or her life.	14	28	90	102	179	191

of compelling the child to use the squinting eye is to place a bandage with adhesive plaster over the straight eye. This is less easily removed and produces a complete occlusion of the seeing eye. In order to improve the visual acuity of the squinting eye, occlusion training must be carried over a considerable period of time. Asking the mother to bandage the seeing eye for a short time each day is rather ineffective, while if the bandage is worn for a week by intervals marked improvement of the visual acuity in the deviating eye is noted. The purpose of this treatment is well understood by our school nurses and teachers. The teacher's encouragement is a valuable assistance. The prescribing of glasses and the occlusion of one eye are the means at hand for retaining the visual acuity of the squinting eye.

With the deviation of one eye there must be two separate images formed with all its discomfort, or the visual impression of the eye must be suppressed. Suppression is nature's means of relieving double vision in the case of squint. The development of the fusion sense is brought about by the use of the amblyoscope. By this device part of a picture is seen by each eye separately and in order to make a single picture fusion must take place. Ten to fifteen minute exercises each day will stimulate this psychic function.

Some mothers who have sufficient time and take proper interest in the welfare of their child can give these exercises at home. Mothers with large families can not be expected to carry out these exercises. It is even difficult for some patients to come to the office often enough to make this training effective.

In those cases in which visual acuity is not improved by the wearing of glasses and the angle of deviation still persists in spite of glasses, occlusion and fusion training, early operation should be instituted. When the angle of deviation has been eliminated or markedly reduced by operation, further treatment for fusion and improvement of the visual acuity is more effective.

There is an age limit beyond which the treatment of squint becomes ineffective, because after the age of eight or ten years it is quite impossi-

TABLE 2

A SUMMARY OF THE STRABISMUS COUNT MADE BY THE NURSES OF THE DULUTH PUBLIC SCHOOLS 1929-1930 (Dr. J. M. Robinson)

Enrollment	Strabismus Count	Internal Strabismus	20/40 or better	20/50 to 20/100	20/100 or worse	Glasses	Operated	Atropine Treatment	Exclusion
2350	75	54	43	15	14	38	5	0	4
2358	54	47	29	18	14	21	3	16	2
1518	33	26	18	13	2	27	2	0	2
2074	38	24	0	0	0	24	4	0	0
2100	45	37	29	13	3	25	1	0	4
1853	43	29	0	0	0	0	3	0	3
12,253	288	217	119	59	33	135	18	16	15

ble to re-educate the fusion sense. The most effective period for treatment must be the preschool age.

TABLE 3

PERCENTAGE LOSS OF VISUAL EFFICIENCY CORRESPONDING TO SNELLEN NOTATIONS FOR DISTANT AS RECOMMENDED BY THE MINNESOTA ACADEMY OF OPHTHALMOLOGY

Vision after Injury	Percentage of Loss	Maximum Compensation
20/20	Normal	
20/25	5	$ 100.00
20/30	10	200.00
20/40	20	400.00
20/50	25	500.00
20/60	33.3	666.65
20/70	40	800.00
20/80	50	1000.00
20/100	75	1500.00
20/120	85	1700.00
20/200	100	2000.00

A study has been made of strabismus cases in the Duluth public schools (Table 2). There are 12,253 in the grade schools of the city. Out of this number 288, or 2.75 per cent, are suffering from squint. Of these, 217 are convergent squint. The visual acuities of the squinting eye of 211 of these cases are as follows: vision of 20/20 to 20/40, 119 cases; 20/50 to 20/100, 59 cases; and vision of 20/100 or less, 33 cases. These pupils ranged in age from six to approximately twelve years. It will be noted that less than one-half of them wear glasses. A small percentage of them have been treated by atropine or occlusion of the fixing eye, or by operation. The work of the nurse is difficult because of the indifference on the part of parents. The seriousness of the visual defects of these children might be compared with the visual loss sustained by injury (Table 3). The percentage loss of vision of one eye and compensation as recommended by the Minnesota Academy of Ophthalmology is tabulated. Visual acuity of 20/200 or less is considered industrially blind. A patient industrially blind receives a maximum compensation for one hundred weeks plus a healing period of twenty-five weeks at twenty dollars per week and a minimum fee of eight dollars per week for the same period. Thus for a total loss of vision in one eye a patient would receive a maximum of twenty-five hundred dollars. Injury resulting in reduction of vision to 20/40 by the Snellen type is calculated as 20 per cent loss of vision, which entitles the patient to five hundred dollars. There were in the Duluth public schools this year ninety-two children who have a functual defect of one eye of at least 20/40. The majority of these children are doomed to go through life with only one useful eye. This statement is made because of the facts brought out by a prominent mining company.

A survey (Table 4) of a prominent mining company of 4,424 men is of interest because it includes men of a variety of trades. Of this number there were 277 men (referred to Dr. F. T. Slyfield) with vision of 20/100 or less in one or both eyes. There were sixty-two men with vision of 20/70 or better in one or both eyes. Of 339 there were thirty-four with a vision of 20/100 or less in one eye due to an early squint and loss of vision from disuse. All these men would be unable to gain employment if they were new applicants. Of the thirty-four only nine still had an outward deviation and only six had an internal deviation. On the other hand, in all of the cases of blindness from disuse the visual acuity was less than 20/100 in the previously squinting eye, or, in other words, these men constitute an industrial hazard, because they possess but one functionating eye.

Some of the local industries (Table 5) require visual tests and safe visual acuity is necessary in order to gain employment. The majority of young men who have suffered from squint and the loss of vision of one eye will be unable to gain employment in any of these industries. There will be an ever increasing demand especially for vision by many employers. This places a serious handicap in the case of the boy in the beginning of his career. Many parents if they knew the seriousness of the study would be less indifferent to the welfare of their children's eyes.

As the demand for safety increases, greater stress is placed on the physical ability of employees. Not only are young men being refused employment because of visual defects but old employees must measure up to certain visual requirements. As the result of physical examinations by Dr. F. F. Slyfield (Table 6), from January 1, 1929, to January 1, 1930, there were eleven railroad employees in the city of Duluth with a marked visual defect of one eye from squint sufficient to cost these men their positions.

A young man with defective vision of one eye should never seek employment in a hazardous industry. If by chance the vision of his seeing eye should be destroyed by accident this man is

TABLE 4

A SURVEY OF APRIL AND MAY, 1929, BY A PROMINENT MINING COMPANY (Dr. F. F. Slyfield)

Total number of men employed	4,424
Total number of men referred for examination and refraction	339
Approximately 70 to 75 per cent of these men examined had never worn glasses before.	
Number of men with vision 20/100 or less in one or both eyes	277 or 6.2 per cent
Number of men with vision 20/70 to 20/100 in one or both eyes	62 or 1.4 per cent
	339
Total number of old employees with amblyopia ex-anopsia	34 or 10 per cent
Total number of old employees with external strabismus	9 or 2.6 per cent
Total number of old employees with internal strabismus	6 or 1.7 per cent

Amblyopia Ex-Anopsia

Occupation	Uncorrected Vision		Corrected Vision		Cause of Defect
	Right Eye	Left Eye	Right Eye	Left Eye	
Clerk	20/40	L. P.	20/20	L. P.	External strabismus, amblyopia ex-anopsia, left eye
?	20/25	20/200	20/20	20/70	Amblyopia ex-anopsia
S. S. Fire	20/25	Fingers 4 feet	20/20	Fingers 20 feet	Amblyopia, ex-anopsia, left eye
Boilermaker	20/200	Fingers 5 feet	20/30	Fingers 5 feet	Amblyopia, ex-anopsia, left eye
Pitman	20/30	20/100	20/25	20/100	Amblyopia, ex-anopsia, left eye
Trackman	20/200	20/50	20/200	20/25	Amblyopia ex-anopsia, right eye
Chip taker	L. P.	20/200	L. P.	20/25	Internal strabismus, amblyopia ex-anopsia, right eye
Sampler	5/200	20/30	15/200	20/20	Amblyopia ex-anopsia, right eye
Watchman	L. P.	20/40	L. P.	20/25	Amblyopia ex-anopsia, right eye
Miner	20/60	Fingers 10 feet	20/25	Fingers 10 feet	Amblyopia, ex-anopsia, left eye
Powderman	10/200	20/45	10/200	20/30	Amblyopia ex-anopsia, left eye; external strabismus, right eye
Motorman	20/25	Fingers 5 feet	20/20	20/200	Amblyopia, ex-anopsia, left eye
Policeman	20/30	Fingers 5 feet	20/20	Fingers 5 feet	Amblyopia ex-anopsia, right eye
Miner	20/30	20/200	20/20	20/100	Amblyopia, ex-anopsia, left eye
Miner	20/40	20/100	20/20	20/100	Amblyopia, ex-anopsia, left eye
Laborer	20/60	20/30	20/60	20/20	Amblyopia ex-anopsia, external strabismus, right eye
?	10/200	20/200	20/200	20/20	Amblyopia ex-anopsia, right eye
	Fingers 4 feet	10/200	Fingers 4 feet	20/70	Amblyopia ex-anopsia, right eye
	20/200	20/30	20/100	20/20	Amblyopia ex-anopsia, right eye
	20/200	Fingers 5 feet	20/30	5/200	Amblyopia, ex-anopsia, left eye
	20/200	20/200	20/20	20/100	Amblyopia, ex-anopsia, left eye
	20/200	20/25	20/100	20/20	Amblyopia ex-anopsia, right eye
	20/25	20/200	20/20	20/200	Amblyopia ex-anopsia and internal strabismus, left eye
	20/50	Fingers 5 feet	20/30	20/100	Amblyopia, ex-anopsia, left eye
	10/100	9/200	20/30	20/100	Amblyopia, ex-anopsia, left eye
Cyc. driller	10/100	20/25	20/200	20/20	Amblyopia ex-anopsia, right eye
Laborer	20/70	Fingers 6 feet	No correction		Amblyopia ex-anopsia

TABLE 4—*Continued*

A SURVEY OF APRIL AND MAY, 1929, BY A PROMINENT MINING COMPANY (Dr. F. F. Slyfield)

Occupation	Uncorrected Vision		Corrected Vision		Cause of Defect
	Right Eye	Left Eye	Right Eye	Left Eye	
Miner	10/200	20/20	10/200	20/20	Amblyopia ex-anopsia, right eye
? Miner	20/100	20/30	20/50	20/20	External strabismus
? Miner	20/100	20/50	20/25	20/20	Internal strabismus, right eye
Trackman	Fingers 10 feet	20/200	Fingers 10 feet	20/45	Internal strabismus, right eye; amblyopia ex-anopsia
Locomotive engineer	20/200	20/20	20/200	20/20	Amblyopia ex-anopsia
Pit foreman	5/200	20/25	0	20/20	Amblyopia ex-anopsia
? Miner	20/50	20/200	20/40	20/40	Myopia, right eye; internal strabismus
Miner	20/30	20/200	20/25	20/70	Amblyopia ex-anopsia
Miner	20/20	Hand 5 feet	20/20	20/200	Corneal scar, left eye; internal strabismus
Miner	Blind	20/30	Blind	20/20	External strabismus; opacity in lens
Miner	20/100	20/100	20/50	20/50	Hyperopia and amblyopia ex-anopsia
Timekeeper	L. P.	20/30	L. P.	20/20	External strabismus right eye; practically blind
Miner	Blind	20/200	Blind	20/200	Cataract, right eye; amblyopia ex-anopsia, left eye
	20/100	5/200	20/30	20/200	Hyperopia, astigmatism, left eye; amblyopia ex-anopsia

20/70 or less—no cases of amblyopia ex-anopsia

TABLE 5

SOME VISUAL REQUIREMENTS IN INDUSTRY

Employer	Minimum Visual Requirements	
	Without Glasses	With Glasses
A Street Railway Company All employees	20/30 — 20/25	All employees
One Railway Company Old employees All applicants	20/40 — 20/40 20/20 — 20/20	
A Telephone Company (2) Motor drivers	20/50 — 20/200 20/30 — 20/40	20/30 — 20/50 20/20 — 20/30
A City Civil Service Truckmen—tradesmen—library—water and light —outside labor (2) Policemen and firemen	20/20 — 20/20 20/20 — 20/20	20/20 — 20/20 Uncorrected
Some departments of the Federal Civil Service		20/30 — 20/20
Aviation (1) (2) (3)	20/20 — 20/20 20/40 — 20/40 20/50 — 20/50	20/20 — 20/20 20/20 — 20/20
A Steel Company	20/20 — 20/60	
Seamen to Captains	20/40 — 20/70	20/20 — 20/40
Chauffeurs and truck drivers	20/20 — 20/30	20/30 — 20/30

TABLE 6

TOTAL NUMBER OF REJECTIONS DUE TO AMBLYOPIA EX-ANOPSIA..........11
Of which there were two cases of Internal Strabismus (Dr. F. F. Slyfield)

Age	Occupation	Uncorrected vision Right eye	Uncorrected vision Left eye	Corrected Vision Right eye	Corrected Vision Left eye	Basis for Rejection
58 (old employee)	Section foreman	20/50	20/200	20/30	20/70	Amblyopia ex-anopsia, left eye; hyperopia
52 (old employee)	Section foreman	20/150	20/100	20/55	20/40	Amblyopia ex-anopsia
70 (old employee)	Hill conductor	20/20	Fingers only			Amblyopia ex-anopsia, left eye; internal strabismus
61? (old employee)	Section foreman	20/200	20/200	20/40	20/60	Amblyopia ex-anopsia, left eye
40 (old employee)	Conductor	20/30	20/100	20/20	20/50	Amblyopia ex-anopsia
65 (old employee)	Lampman	20/30	8/200	20/20	10/100	Amblyopia ex-anopsia, hyperopia, internal strabismus; otosclerosis, both ears
37 (old employee)	Section foreman	20/30	20/200	20/25	20/200	Amblyopia ex-anopsia, left eye
51? (old employee)	Lampman	20/200	20/100	20/70	20/40	High degree of hyperopia; amblyopia ex-anopsia, right eye
31 (old employee)	Machinist helper Apprentice	20/200	20/20	20/100	20/20	Amblyopia ex-anopsia, right eye
53 (old employee)	Conductor	10/200	20/200	20/200	20/40	Amblyopia ex-anopsia, right eye; high degree hyperopia, left eye
29 (old employee)	Boilermaker helper	20/25	20/100	20/20	20/100	Amblyopia ex-anopsia, left eye

entitled to compensation for the loss of one eye only and if he is industrially blind in the other eye, whether from squint or any other cause, he is entitled to compensation for permanent total loss of vision which is paid him by the state out of a special fund known as the special compensation fund. Some employers carry their own industrial insurance and they employ safety engineers to eliminate accident. The smaller employer is under a handicap because he has no record of the physical or visual condition of his employees. Following some slight injury the oculist finds a loss of vision often out of proportion to the severity of the injury. Many times he is unable to submit evidence that the eye is blind from a previous squint and disuse.

SUMMARY

1. Effective treatment of squint must be carried out before the school age.
2. Loss of vision of one eye from squint is a serious handicap.
3. No physician should be guilty of advising parents that the child will outgrow the defect.

THE ASSOCIATION OF PEPTIC ULCER AND CHOLECYSTIC DISEASE*

Andrew B. Rivers, M.D.
Division of Medicine, The Mayo Clinic
and
James B. Mason, M.D.
Fellow in Surgery, The Mayo Foundation
Rochester, Minnesota

THE clinician often is chagrined because of the fact that despite a carefully taken history and detailed laboratory procedures he fails to make a preoperative diagnosis of clinically associated lesions of the gastric or biliary tract.

Hartman and Rivers have recently called attention to associated lesions found at operation in 700 cases clinically diagnosed as duodenal ulcer. The most common lesion was chronic appendicitis (44.4 per cent) ; subacute appendicitis, cholecystitis and gastric ulcer occurred infrequently. In 375 cases in which gastric ulcer was clinically diagnosed, chronic appendicitis was the major associated lesion, being found in 35.7 per cent of the cases. Carcinomatous ulcers were found in 2.1 per cent of the cases. They pointed out that if the more commonly associated lesions are borne in mind, a diagnosis may be made correctly oftener if a painstakingly evaluated history is taken.

In contrast to the associated lesions of peptic ulcer, Rivers and Hartman recorded the associated lesions found at operation in 879 cases which were clinically diagnosed cholecystitis or cholelithiasis. Subacute appendicitis was the most common associated lesion discovered (29.5 per cent) ; peptic ulcer was found in only 3.2 per cent. The most significant of the complicating or associated factors discovered during operation was the presence in four cases of carcinoma of the biliary system.

The authors carefully reviewed the case histories but did not find data by which this complication could have been recognized. They concluded that peptic ulcer as a complication of cholecystic disease usually lends itself to diagnosis, that a diagnosis of pancreatitis can only be made tentatively by the surgeon or the clinician, that hepatitis must necessarily be severe before symptoms are manifest, and that a better means of recognizing carcinoma is needed.

Our purpose in making this report is to call attention to the percentage of lesions associated with the different types of operable lesions in the upper right quadrant, regardless of preoperative diagnosis, with the hope of obtaining a correct impression of the actual existence of such associated lesions. The cases were selected for study because the lesions were discovered at the exploration. An attempt was also made to gain, as far as possible, accurate knowledge regarding the actual histopathologic conditions demonstrable in the gallbladder whenever associated disease was found.

MATERIAL USED

The data were obtained from 2,161 operative records. This included 700 cases of duodenal ulcer verified surgically, 435 cases of gastric ulcer, and 1,026 cases of cholecystic disease. Cholecystic disease was found in ninety-five (13.6 per cent) of the cases of duodenal ulcer. In the cases of gastric ulcer pathologic changes were found in the gallbladder or ducts in thirty-four cases (7.8 per cent). In the cases of cholecystitis or cholelithiasis only seventy-three (7.1 per cent) showed evidence of a peptic lesion. The 202 cases including both a peptic ulcer and a lesion in the gallbladder or ducts were studied in detail.

DUODENAL ULCER ASSOCIATED WITH CHOLECYSTIC DISEASE

In ninety-five of the 700 cases of duodenal ulcer in which operation was performed at The Mayo Clinic there was evidence of disease in the gallbladder or ducts.

In a group of forty cases (42 per cent) in which the disease of the gallbladder was eradicated by operation and studied pathologically, the lesions were as follows: chronic cholecystitis with stones in twenty-five cases, chronic cholecystitis without stones in ten cases, subacute

---

*Submitted for publication September 19, 1930.

cholecystitis with stones in four cases, and subacute cholecystitis without stones in one case.

In a group of twenty-six cases (27 per cent) in which removal of the gallbladder was not deemed advisable because of increased surgical risk, the lesions were: a thick-walled gallbladder in sixteen cases, cholecystitis in six cases, benign tumor of the fundus of the gallbladder in two cases, and gallstones in an obviously diseased gallbladder in two cases.

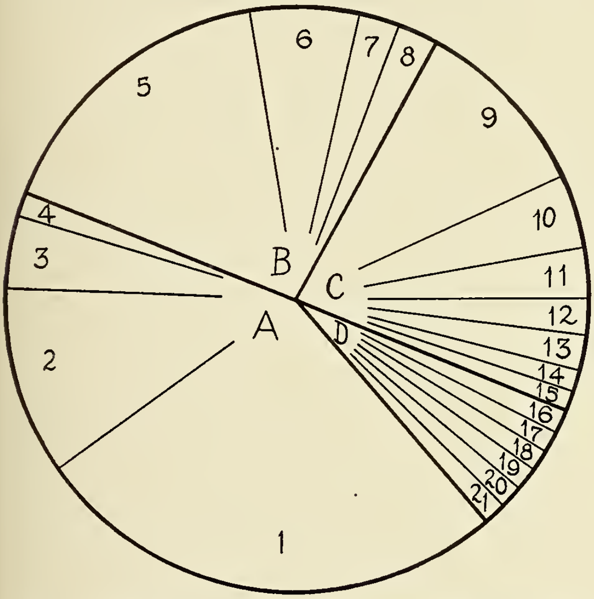


Fig. 1. Duodenal ulcer with cholecystic disease (ninety-five cases). Section A, treated surgically: (1) chronic cholecystitis with stones, twenty-five cases (26.3 per cent); (2) chronic cholecystitis without stones, ten cases (10.5 per cent); (3) subacute cholecystitis with stones, four cases (4.2 per cent), and (4) subacute cholecystitis without stones, one case (1 per cent). Total 42.0 per cent.

Section B, not advisable to treat surgically at this time because of surgical risk: (5) thick-walled gallbladder, sixteen cases (16.3 per cent); (6) cholecystitis present, six cases (6.3 per cent); (7) benign tumor in fundus of gallbladder, two cases (2.1 per cent). and (8) gallstones present, two cases (2.1 per cent). Total 27.4 per cent.

Section C, cholecystic disease suspected from notes taken at operation: (9) "adhesions about gallbladder," ten cases (10.5 per cent); (10) gallbladder "enlarged," four cases (4.2 per cent); (11) gallbladder "distended," three cases (3.2 per cent); (12) gallbladder "tense," two cases (2.1 per cent); (13) gallbladder "not normal color," two cases (2.1 per cent); (14) gallbladder "edematous," one case (1 per cent), and (15) gallbladder perforated through at margin of liver forming hourglass, one case (1 per cent). Total 24.2 per cent.

Section D, Miscellaneous: (16) malignant stricture of the common bile duct, one case (1 per cent); (17) benign mass around neck of the gallbladder and common bile duct, one case (1 per cent); (18) enlarged glands along common bile duct, one case (1 per cent); (19) benign stricture of common bile duct, previous cholecystectomy, one case (1 per cent); (20) negative exploration of the common bile duct, previous cholecystectomy, one case (1 per cent), and (21) residual hepatitis, previous cholecystectomy, one case (1 per cent). Total 6.3 per cent.

In a group of twenty-three cases (24 per cent) in which the surgical diagnosis was questionable, adhesions about the gallbladder were found in ten cases, enlargement of the gallbladder in four cases, distention in three cases, tenseness in two cases, abnormal color in two cases, edema in one case, and hour-glass contraction after the gallbladder had perforated through at the margin of the liver in one case.

In a group of six cases (6 per cent) which could not be included in any of the preceding three groups, the lesions were as follows: malignant stricture of the common bile duct in one case, benign mass in the wall of the gallbladder in one case, enlarged lymph nodes in one case, and (in three cases in which cholecystectomy and subsequently operation for duodenal ulcer were performed) benign stricture of the common bile duct in one case, questionably negative exploration of the common bile duct in one case, and residual hepatitis in one case.

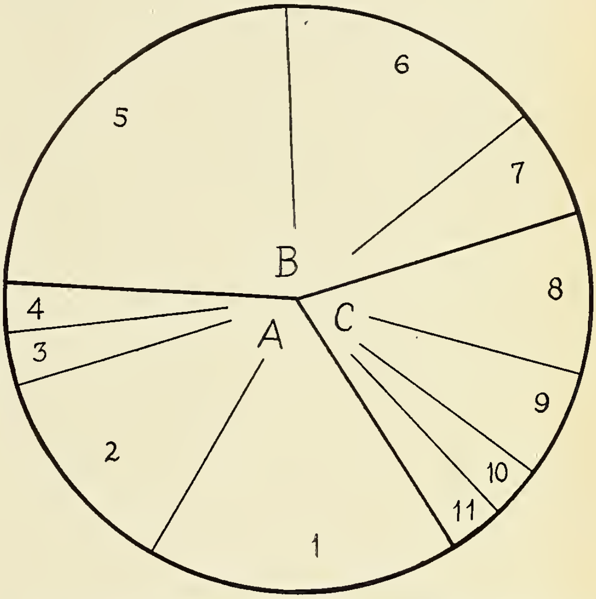


Fig. 2. Gastric ulcer with cholecystic disease (thirty-four cases). Section A, treated surgically: (1) chronic cholecystitis with stones, six cases (17.6 per cent); (2) chronic cholecystitis without stones, four cases (11.8 per cent); (3) subacute cholecystitis with stones, one case (2.9 per cent), and (4) subacute cholecystitis without stones, one case (2.9 per cent). Total 35.2 per cent.

Section B, not advisable to treat surgically at this time because of surgical risk: (5) gallbladder thick-walled, eight cases (23.5 per cent); (6) gallstones present, five cases (14.7 per cent), and (7) cholecystitis present, two cases (5.9 per cent). Total 44.1 per cent.

Section C, cholecystic disease suspected from notes taken at operation: (8) "adhesions about gallbladder," three cases (8.8 per cent); (9) gallbladder "enlarged," two cases (5.9 per cent); (10) gallbladder "tense," one case (2.9 per cent), and (11) "practically a congenital absence of the gallbladder, liver enlarged," one case (2.9 per cent). Total 20.5 per cent.

GASTRIC ULCER ASSOCIATED WITH CHOLECYSTIC DISEASE

In thirty-four of a series of 435 cases of gastric ulcer in which operation was performed and which were known to be benign, disease of the gallbladder was associated.

In a group of twelve cases (35 per cent) operation was performed on the gallbladder. The lesions in this group were as follows: chronic cholecystitis with stones in six cases, cholecystitis without stones in four cases, subacute cholecystitis with stones in one case, and subacute cholecystitis without stones in one case. Removed specimens were studied pathologically.

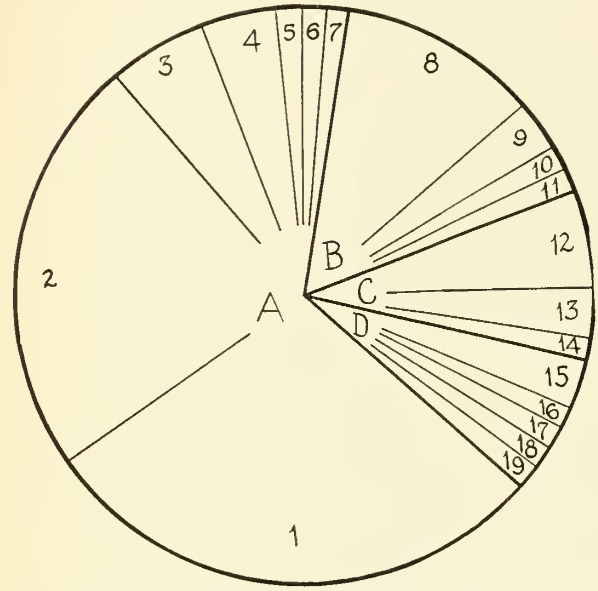


Fig. 3. Cholecystic disease with peptic ulcer (seventy-three cases). Section A, treated surgically: (1) chronic duodenal ulcer, twenty-one cases (28.8 per cent); (2) subacute duodenal ulcer, seventeen cases (23.3 per cent); (3) chronic duodenal ulcer with duodenitis, four cases (5.5 per cent); (4) duodenitis only, three cases (4.1 per cent); (5) jejunal ulcer, previous gastro-enterostomy, one case (1.4 per cent); (6) pyloric obstruction due to ulcer (?), previous excision of gastric ulcer, one case (1.4 per cent), and (7) gastric ulcer, questionable malignancy, one case (1.4 per cent). Total 65.9 per cent.

Section B, not advisable to treat surgically at this time because of surgical risk: (8) chronic duodenal ulcer, eight cases (10.9 per cent); (9) chronic gastric ulcer, two cases (2.7 per cent); (10) ulcerated duodenitis, one case (1.4 per cent), and (11) malignant lesion of the stomach (?), posterior wall at cardia, one case (1.4 per cent). Total 16.4 per cent.

Section C, scar or healed ulcer: (12) scar in duodenum, four cases (5.5 per cent); (13) healed duodenal ulcer, two cases (2.7 per cent), and (14) gastric and duodenal ulcers, both inactive, one case (1.4 per cent). Total 9.6 per cent.

Section D, ulcer suspected from notes taken at operation: (15) duodenum "thick-walled," one case (1.4 per cent); (16) questionable duodenitis, one case (1.4 per cent); (17) questionable duodenal ulcer, one case (1.4 per cent); (18) considerable "inflammatory reaction" in duodenum "in area of gallbladder," one case (1.4 per cent), and (19) thickened pylorus and stomach thick-walled, previous history of obstruction, one case (1.4 per cent). Total 7.0 per cent.

In a group of fifteen cases (44 per cent) the surgeon made a definite anatomic diagnosis of cholecystic disease but did not perform cholecystectomy because of increased surgical risk. The lesions were: thick-walled gallbladder in eight cases, gallstones in five cases, and chronic cholecystitis in two cases.

In a group of seven cases (21 per cent) the surgeon's observation at operation indicated disease or anomalous lesions resident in the gallbladder, as follows: adhesions about the gallbladder in three cases, enlargement of the gallbladder in two cases, tenseness of the gallbladder in one case, and almost complete congenital absence of the gallbladder with enlargement of the liver in one case.

CHOLECYSTIC DISEASE ASSOCIATED WITH PEPTIC ULCER

In seventy-three of a series of 1,026 cases in which operation was performed for cholecystic disease, peptic ulcer was found to be associated.

In a group of forty-eight cases (66 per cent) it was thought advisable to deal with the associated ulcer surgically. An analysis of the ulcers included in this group was as follows: chronic duodenal ulcer in twenty-one cases, subacute duodenal ulcer in seventeen cases, chronic duodenal ulcer with duodenitis in four cases, duodenitis alone in three cases, jejunal ulcer (after posterior gastro-enterostomy) in one case, pyloric obstruction with suspected ulcer in one case, and gastric ulcer which was questionably malignant in one case.

In a group of twelve cases (16 per cent) the surgeon found definite disease of the stomach and duodenum but felt that further surgical procedures were contra-indicated because of increase of the operative risk; in one case surgical procedures were not carried out because of obvious inoperability of the associated lesion. In this group the following lesions were found: chronic duodenal ulcer in eight cases, chronic gastric ulcer in two cases, ulcerated duodenitis in one case, and a probably malignant lesion of the posterior wall of the stomach in one case.

In a group of seven cases (10 per cent) healed gastric or duodenal lesions were found: scar in the duodenum in four cases, healed duodenal ulcer in two cases, and inactive duodenal ulcer and gastric ulcer in one case.

In a group of six cases (8 per cent) the surgical dictation led to the suspicion of an associated ulcer, but this was not definite. The lesions in this group were as follows: questionable duodenal ulcer in one case, questionable duodenitis in one case, a thick-walled duodenum in two cases, considerable inflammatory reaction in the duodenum in the area of the gallbladder in one case, and a thickened pylorus and thick-walled stomach (due to previous obstruction) in one case.

COMMENT

It is sometimes difficult, or even impossible, to make a differential diagnosis of peptic ulcer or of cholecystitis. The association of the two conditions presents further difficulties, it frequently being difficult to determine which disease is responsible for the more serious symptoms. In 37 per cent of the cases of surgically verified subacute or acute duodenal ulcer, the history had sufficient characteristics usually attributed to cholecystic disease to prompt a preoperative diagnosis of associated cholecystic disease, and this, despite the fact that there was definite roentgenologic evidence of duodenal ulcer. In a review of a series of cases[4] in which nonulcerating areal inflammatory duodenal lesions were found at operation, a tendency was noted for the patients to have localizing distress in the upper right quadrant. The probability suggests itself that the pain arising from the duodenal wall itself is felt in the upper right quadrant.

Duodenitis and acute or subacute duodenal ulcer, although likely to mimic disease of the gallbladder, usually have definite characteristics of peptic ulcer in that the distress reaches its maximum several hours after the meal and is relieved by the ingestion of food or soda. The pain may be severe and in both instances may be referred into the thorax. Pain referred through to the back is not uncommon in either cholecystic disease or ulcer, particularly if the latter is a penetrating lesion. It is unusual for the pain of ulcer to be referred to the shoulder, but this is rather a common symptom in diseases of the gallbladder.

In acute or subacute cholecystitis, the area of complaint is usually well localized in the upper right quadrant. There is likely to be tenderness and rigidity in the right infracostal area. Tenderness increases as the palpating finger approaches the lower margin of the ribs. The gallbladder may be paplable. The distress is fairly constant and is not relieved by the ingestion of food. On the contrary, this usually intensifies the symptoms for a brief period. There may be much flatulence and a qualitative food relationship, fats and fried foods being especially likely to intensify symptoms. The syndrome lacks the precision and clock-like regularity of that usually seen in uncomplicated ulcer, and the succession of pain, food and ease is noted several times or many times each day during the period of exacerbation which may last for several weeks.

An icteric or subicteric tint to the skin is frequently noted and a slight elevation of the icterus index or serum bilirubin further tends to localize the disease in the gallbladder or ducts. The vomiting of blood, even in small amounts, or the detection of blood in the stools, is almost certain evidence that the lesion is not in the gallbladder. Roentgenologic investigation may be the deciding factor in making the diagnosis.

The detection of gallstones in the cholecystogram will confirm the diagnosis. Stones becoming impacted in a duct usually produce symptoms sufficiently definite to permit an accurate diagnosis. Even then, there is always the possibility of associated lesions.

The differentiation of chronic disease of the gallbladder with stones or of uncomplicated peptic ulcer is usually not difficult. Blackford and Dwyer called attention to two clinical types of cholecystitis with stones: (1) attacks of gallstone colic for years and then the gradual onset of chronic dyspepsia, and (2) chronic dyspepsia with milder attacks of acute indigestion, often followed by biliary colic. A carefully taken history almost invariably will disclose evidence suggesting the presence of gallstones. The severity of the colic is not so easily forgotten and thus patients as a rule call attention to acute indigestion which they experienced perhaps many years previously.

The pain of gallstone colic usually comes on without much warning and it frequently stops just as quickly, leaving usually, however, residual upper right abdominal tenderness. Often the site of the pain is epigastric, although it may start in the upper right quadrant. Usually it is a deepseated through-and-through pain radiating often into the neck and right shoulder. It is severe, may be lancinating, and is often described "from which there seems to be no escaping except by hypodermics or vomiting." This pain is intensified by associated upper abdominal flatulence which is severe. The breathing seems to be cut off because a deep breath intensifies the symptoms. Emesis occurs at times and the vomitus is usually greenish or yellowish. The attack may terminate quickly, with or without vomiting, but frequently several hypodermics or even an anesthetic may be necessary to obtain control of the pain.

Occasionally transitory fleeting twinges of upper right abdominal pain are noted by patients with gallstones. These pains are likely to be referred into the back. If the gallstone migrates into the common bile duct, chills, fever and jaundice are frequently added to the symptom of pain.

Uncomplicated peptic ulcer includes nothing as a rule which might be confused with the syndrome of gallstones. The symptoms arising from deep penetration of the wall of the duodenum or stomach may simulate the pain of gallstones, but there are many factors which should help in differentiating the two conditions. The history of previous spells of heartburn, distress after meals, and ease from soda and food, all argue for ulcer. The onset of the pain is usually different. In cases of gallstones the onset is rapid, that is, precipitation from comfort to severe pain, and in cases of ulcer the onset is slower. An exception to this is the occasional acute perforation of an ulcer without preliminary indigestion. This may occur following ingestion of an unusually large meal, an alcoholic debauch or excessive exertion. The picture of a patient with a ruptured peptic ulcer is quite characteristic. The pain is usually extremely severe. It usually starts in the epigastrium, whence it is referred into the thorax or back. Occasionally the pain is in the lower right part of the abdomen. It is described as a persistent, deep-seated, sharp, cutting pain intensified by movement or even by respiration. Prostration is marked, and there may be associated nausea and vomiting. There is extreme tenderness over the epigastrium, and characteristic board-like rigidity of the upper part of the abdomen is almost invariably noticeable. Occasionally there is a shifting dulness in the flanks due to the pressure of free fluid. Hepatic dulness may be obliterative.

It is extremely rare that any condition of the gallbladder would simulate the picture of ruptured ulcer, although occasionally an acutely infected gallbladder will rupture, and resulting peritonitis may cause a mistaken diagnosis. Rupture of the gallbladder, except following trauma, always is a later development in the course of cholecystitis, and a carefully taken history should contain evidence wherewith to make a diagnosis. Ruptured ulcer almost always occurs in men; acute cholecystic disease occurs much more commonly in women.

The differential diagnosis of noncomplicated chronic peptic ulcer or of chronic cholecystic disease without stones may be difficult. Not that it is difficult to recognize the presence of active chronic peptic ulcer, but the difficulty as a rule is to be certain that there is no associated disease in the gallbladder. It is important to note that not every duodenal deformity signifies ulcer, that not every duodenal ulcer is active, and that not every active ulcer is the cause of the complaints which activated the patient to obtain relief. Symptoms, therefore, should be evaluated with the greatest thoroughness. An uncomplicated active peptic ulcer usually presents a clear-cut syndrome. Great irregularities in the history suggest that the ulcer, if shown to be present by roentgenologic investigation, may not be active, that the ulcer is complicated in some way, or that there is an associated disease elsewhere in the abdomen. The history may decide the point, or further roentgen-ray study of the gallbladder or colon may make the diagnosis clear. Functional disturbances must be ruled out first by carefully taken histories and proper interpretation of symptoms. Hospital observation and a therapeutic test for ulcer usually are of great help in the making of a correct diagnosis. If patients who have the duodenal deformity attributable to ulcer fail to obtain relief from their symptoms even when the diet is bland, and the gastric acidity is adequately controlled, it may be safe to assume that the ulcer is in some way complicated. Even a perforative type of ulcer is usually relieved by the milk-alkali regimen within four or five days. Persistent upper abdominal distress under these conditions would strongly suggest associated cholecystic disease.

The cholecystogram has been of unquestionable value in helping to detect certain instances of cholecystic disease in which the symptoms were very indefinite and in which a diagnosis preoperatively would have been impossible. The so-called reflex of the gallbladder as a cause of indigestion is extremely indefinite. Clinical syndromes have from time to time been presented which are assumed to be diagnostic of chronic disease of the gallbladder. These syndromes may include indefinite epigastric discomfort, following meals, much upper abdominal flatulence, nausea or vomiting after meals, and belching and bloating after certain types of food such as fats, fried foods, onions, or apples. In our experience such syndromes are unreliable as indications of cholecystic disease. Functional disturbances of the upper part of the digestive tract, constipation, food allergies, and many other conditions are quite as likely to give similar syndromes. There should be some hesitancy in blaming the gallbladder for such syndromes unless the previous history includes localized evidence of more severe and more definite disease in the upper right quadrant.

We have noted the best results following surgical treatment of cholecystic disease in cases in which there was definite clinical evidence of the disease. This is also the observation of Judd, who carefully analyzed the surgical results in various types of cholecystic disease. He found encouraging results in cases in which there were inflammatory changes in the wall of the gallbladder even though these were slight. He stated, however, "If the patient's symptoms were of the chronic dyspeptic type or if the prominent features were soreness, tenderness, and aching in the side, the likelihood of cholecystectomy promoting cure was not great."

There is no doubt that a chronically diseased gallbladder does produce symptoms. The present difficulty seems to arise from attempting to make our syndrome fit the majority of these cases. There are various types of chronic cholecystic disease, and it will become necessary to study these cases separately and carefully to analyze a larger series of histories in each group. Such a study should greatly increase our ability to correlate clinical and histopathologic data, which in turn would obviously increase efficiency in the treatment of cholecystic diseases.

SUMMARY

Evidently cholecystic disease is demonstrable almost twice as frequently in association with duodenal as with gastric ulcer. The propinquity of the duodenum and gallbladder may in part be responsible for this. It is readily conceivable that the inflammatory condition in one organ may extend to and involve to a varying degree the other organ.

Still more striking is the fact that gastric ulcer or thickening in the gastric musculature (gastritis?) was demonstrable as a complication of surgical cholecystic disease only six times in 1,026 cases; benign duodenal lesions were found more than twelve times as commonly as gastric lesions during operation on the gallbladder.

If the relative frequency of these associated conditions is borne in mind, there should be greater accuracy in the proper recognition of such a complication. Not infrequently non-surgical measures instituted for the care of peptic ulcer fail because of the fact that such a lesion is complicated by associated disease in the gallbladder. Every effort should, therefore, be made to make as complete a diagnosis as possible.

BIBLIOGRAPHY

1. Blackford, J. M., and Dwyer, M. F.: Gastric symptoms with particular reference to gallbladder disease. Jour. Am. Med. Assn., 83:412-416, 1924.
2. Hartman, H. R., and Rivers, A. B.: Benign gastric and duodenal ulcers; clinical diagnosis and the conditions found at operation. Arch. Int. Med., 44:314-338, 1929.
3. Judd, E. S.: Cholecystitis. Northwest Med., 25: 167-171, 1926.
4. Rivers, A. B.: A clinical study of duodenitis, gastritis and gastrojejunitis. Ann. Int. Med. (in press).
5. Rivers, A. B., and Hartman, H. R.: Abdominal exploration in cases diagnosed cholecystitis or cholelithiasis before operation. Arch. Int. Med., 45:523-534, 1930.

UNUSUAL DEFICIENCY SYNDROME SECONDARY TO DUODENAL OCCLUSION AND ULCERATIVE COLITIS

ALBERT M. SNELL, M.D.*
Rochester, Minnesota
and
L. DUDLEY BUMPUS, M.D.**
Grand Rapids, Michigan

IN spite of many precise experimental and clinical studies there is still a great deal of confusion about the exact relationship of the vitamins to deficiency syndromes. Numerous unsuccessful attempts to treat supposed deficiency states with vitamin concentrates indicate that lack of these substances is not alone responsible for the clinical syndrome encountered. This fact is further emphasized by the differences noted between experimental vitamin deficiency and clinical states supposedly due to lack of the same vitamins. Minot, in reviewing the general subject of deficiency disease, called attention to the fact that these conditions are due to a variety of causes, acting individually or combined, and stressed the fact that dietary deficiency syndromes are not always due to lack of vitamins alone, but also to poorly balanced diets, incomplete or low intake of protein, ingestion of an excess of carbohydrate, infection, or altered physiologic mechanisms. When one adopts this broader view of the deficiency syndromes, the probable frequency of abortive, or border-line types of deficiency is at once apparent. The following case is presented to illustrate the multiplicity of symptoms of deficiency disease which may arise from the causes mentioned by Minot.

REPORT OF CASE

A salesman, aged thirty-two years, was admitted to hospital as an emergency case, November 18, 1929. He had traveled to Rochester alone in his car and had collapsed in a local restaurant. On his dmission to the hospital he was extremely weak, dehydrated, and in a state bordering on shock. After he had been revived, the following history was obtained: In 1914 he had suffered an attack of acute appendicitis and operation was advised, but he declined to have this done and recovered uneventfully. Following this he became extremely constipated, and shortly afterward he had an attack of marked abdominal cramping, nausea, and vomiting following the eating of over-ripe fruit. After this episode, which lasted for about three days, he never had been entirely well. Immediately after each meal he suffered with epigastric pain, from which he obtained relief by induced vomiting. He was repeatedly awakened at night by epigastric pain and always obtained relief by emptying his stomach. He had never been relieved by the use of food or soda. From 1914 to 1916 he lost about 35 pounds in weight, chiefly because of a voluntarily restricted diet of soft foods and liquids, and he became so weak that it was impossible for him to continue with his work. In 1917 a roentgenogram had been taken of the stomach, which revealed gastric ulcer with hourglass deformity. Since medical treatment did not produce improvement the patient was advised to have surgical treatment, but declined. Later, however, his symptoms became so much worse that he consented to operation. He stated that the surgeon was unable to do anything to correct the condition which was found in the stomach at the time, and that he was advised to "build up" before any further radical treatment be attempted. In 1918 another attempt at surgical treatment was made. At this time a gastric ulcer was found and gastro-enterostomy was performed. Immediately after the operation very troublesome diarrhea developed and the patient passed from four to six stools daily over a period of about two years. The epigastric pain had been relieved somewhat by the operation and he no longer vomited, but he suffered more or less constantly with abdominal cramps, and, because of the persistent diarrhea, became very weak. Under treatment the diarrhea gradually subsided, and from 1922 to 1928 the patient was in fair health and was able to follow his usual occupation. In 1928 he again began to have attacks of diarrhea, considerably more severe than those which had occurred previously. He passed about ten to fifteen loose stools a day, which frequently contained mucus and occasionally blood. He again restricted his diet, taking practically no fruits or vegetables, and very little milk. As a result of the dietary restriction and diarrhea he lost weight and strength rapidly. He noted particularly that his legs were weak and that he walked with considerable difficulty. In August, 1929, his left leg began to swell; the swelling quickly extended to the right leg and later involved the genitals and abdomen. During this period, he noted deepening color of the skin. His principal complaints on admission were of diarrhea, anorexia, and extreme weakness.

---

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota.

**Former Fellow in Medicine, The Mayo Foundation.

The patient was seen to be very weak, dehydrated, and cachectic. There was pronounced pigmentation of the skin, most marked over the extremities and bony prominences. There was no sharp line of demarcation, such as is usually seen in pellagra, but the lesions were otherwise suggestive of it. A scaly, pigmented eruption was noted about the genitals. There was a good deal of edema of the lower extremities and back, and the abdomen was moderately distended with fluid (Fig. 1). The tongue was red, glazed, and somewhat atrophic. Only a few teeth remained and there was no adequate masticating surface in the mouth. The heart was slightly enlarged, but was otherwise normal. Examination of the lungs gave negative results, except for a few dry, bronchial râles. A small umbilical hernia and a large reducible right scrotal hernia were noted. Rectal examination revealed only marked local tenderness. The blood pressure in millimeters of mercury was 94 systolic and 56 diastolic.

Urinalysis repeatedly gave negative results. The concentration of hemoglobin was 28 per cent; erythrocytes numbered 1,300,000 and leukocytes 4,000 in each cubic millimeter of blood. The differential count gave normal values, and blood smears gave no evidence of pernicious anemia. Aspiration of gastric content after a test meal did not reveal free hydrochloric acid. The concentration of blood urea was 15 mg., of blood sugar 73 mg. and of blood chlorides 602 mg. in each 100 c.c. The carbon dioxide combining power of the plasma was 50 volumes per cent. The value for serum protein was 4.6 gm. in each 100 c.c., of which 47 per cent was albumin. There was a proportionate reduction in the serum calcium; the reading was 7.7 mg. in each 100 c.c. Roentgenograms of the thorax gave negative results. Roentgenograms of the long bones were negative for osteoporosis. Repeated examinations of the stools were negative for parasites, pus, or blood, and an abnormal content of fat was not demonstrable by the usual tests. The Wassermann reaction of the blood repeatedly was strongly positive. A tentative diagnosis of a malfunctioning gastro-enteric stoma, with a possible gastrocolic fistula, was made and emergency intravenous injection of fluids was instituted. Transfusion of 500 c.c. of blood also was given. As the patient revived under this treatment, certain additional features were noted. He was found to be in a state of mild delirium a good deal of the time, and was extremely uncoöperative. A neurologic consultant reported the presence of extensive peripheral neuritis, with absent reflexes and reduced sensation in the lower extremities. It became apparent that the patient was suffering not only from some grave disturbance in the digestive tract, but also from latent syphilis and from a deficiency syndrome characterized by pigmentation, residual glossitis, peripheral neuritis, mild dementia, and extensive general edema of the nutritional type.

Attempts at identification of the gastro-intestinal lesion were highly unsatisfactory because of the weakened condition of the patient and his mental disturbance. Fluoroscopic examination of the stomach was attempted and it was found that some barium was passing through the pylorus while a good deal passed through a large gastro-enteric stoma into a greatly dilated jejunal loop. Because of the persistent diarrhea, repeated attempts at proctoscopic examination were made, but the patient resisted vigorously. Fluoroscopic examination of the colon seemed to be out of the question. Camphorated tincture of opium (paregoric), kaolin, a diet high in vitamins and dilute hydrochloric acid controlled the diarrhea somewhat, and at the end of three weeks in the hospital it was thought that the patient's condition was sufficiently good to attempt antisyphilitic treatment. Although it was generally agreed beforehand that the syphilis probably had no bearing on the patient's general condition, it was thought that arsenic might have a beneficial effect on the pellagrous manifestations. The patient did not make a significant response to four doses of neo-arsphenamine, although there was a slight, nonspecific, tonic effect. The neuritis remained unchanged; the pigmentation of the skin, and the eruption on the genitals were not altered in any way, and the general anasarca persisted.

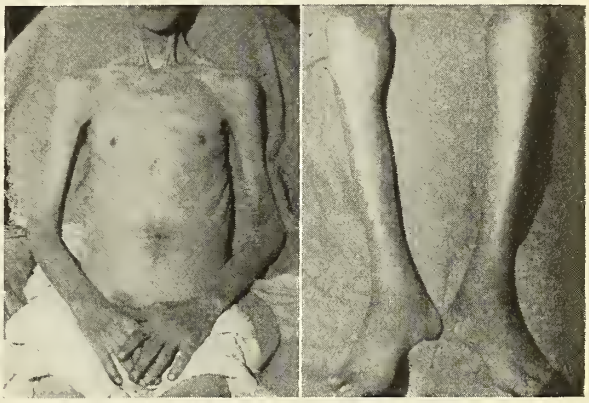


Fig. 1. The patient shortly after admission. Pigmentation of the lower extremities, emaciation, ascites, and muscular atrophy are evident.

Attempts to treat the deficiency syndrome were almost as unsuccessful. During the whole period, while the patient was in the hospital, his average daily intake of food was extremely small and he could be induced to take only very limited amounts of concentrated foods. A variety of diets was tried, but the patient's anorexia and apathy toward food persisted. His mild delirium and his lack of coöperation effectively nullified any attempts at forced feeding. The patient's last two weeks in the hospital were characterized by exacerbation of diarrhea, increased severity of the mental symptoms, and general decline in strength. The blood pressure remained extremely low, ranging from 80 to 90 systolic; the edema and ascites decreased somewhat. Solutions of acacia, of glucose, and physiologic solution of sodium chloride, given intravenously, failed to have any supportive effect. A new complaint, that of photophobia and diplopia, presented itself; it appeared to be due to convergence insufficiency more than to palsy of any single muscle. As a last resort, and because of the possibility that a gastrocolic fistula was present, sugical intervention was considered, but because of the weakness of the patient this was deferred indefinitely. At the end of seven weeks in the hospital, the patient died suddenly, and without any immediate prodromal symptoms. The suddenness of his death was similar to that which is so commonly reported in beriberi.

At necropsy, extreme emaciation, edema, and pigmentation were striking. On opening the peritoneal cavity, the omentum was found to be adherent to the scars resulting from the previous laparotomy. The abdomen contained 1,000 c.c. of cloudy fluid, and its upper portion was a dense mass of adhesions. On opening the pleural cavities, each was found to contain about 500 c.c. of cloudy fluid. The pericardial sac contained 100 c.c. of clear, straw-colored fluid. There were healed lesions of tuberculosis in the lungs and the nodes of the hilum, and there were a few subpleural, petechial hemorrhages. There was also terminal bronchopneumonia. The liver was negative to examination, except for a small hemangioma. The gallbladder contained one stone and a moderate degree of cholecystitis was present. Examination of the spleen, pancreas, suprarenal glands, kidneys, bladder, testes, thyroid gland, and thymus was essentially negative. The most significant abnormalities were confined to the digestive tract. The esophagus was normal. The stomach was contracted, especially in the prepyloric region, and on the anterior surface a stoma made at gastro-enterostomy was present and was in good condition. The mucosa of the stomach was pale and rugæ were absent. At the angle of the stomach, on the lesser curvature, the mucosa was injected and irregular; a definite scar was not present. What appeared to be the scar of a previous ulcer was noted in the duodenum. On attempting to follow the duodenum downward, occlusion was encountered about 4 cm. below the papilla of Vater (Fig. 2). At this point the lumen of the duodenum was obliterated and was replaced by a fibrous cord 4 mm. in diameter for an extent of 2.5 cm. Below this cord the lumen became normal in size, and 10 cm. farther on, in the jejunum, was the stoma of the gastro-enterostomy. The remainder of the small intestine was essentially normal. The colon, however, presented a picture of a diffuse, ulcerative type of colitis. There were many superficial ulcers with serpiginous borders, between which islands of edematous, whitish mucosa were seen. Sections of the colon revealed superficial ulceration, which in places extended to the muscularis mucosæ. These ulcers were covered with a fibrinopurulent exudate, which formed a pseudomembrane and extended over large areas of the surface (Fig. 3).

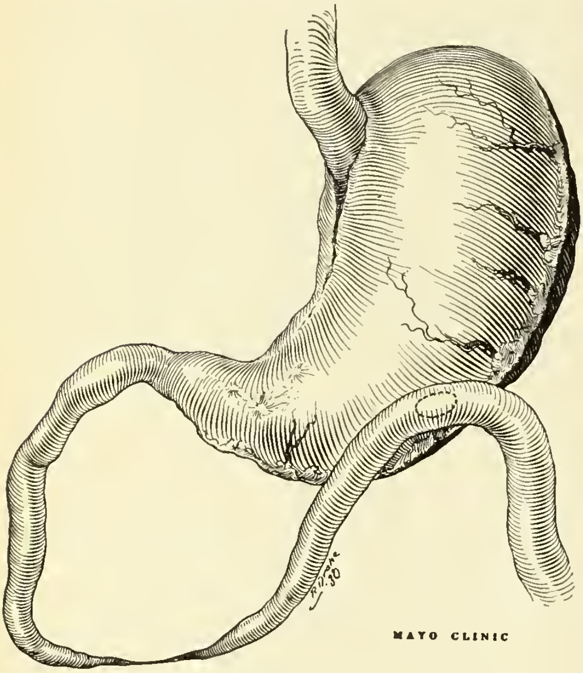


Fig. 2. The condition of the stomach and duodenum.

Because of the mental symptoms and the peripheral neuritis, a special examination of the brain and spinal cord was made. Both were normal in gross appearance, but on section definite evidences of pathologic change were encountered. In the brain, there was a section of the right superior frontal convolution which gave evidence of considerable myelin degeneration, not limited to the perivascular regions, but diffuse and extending into the radiating fibers in the cortex. A similar change, of lesser degree, was noted in the optic chiasm. The peripheral nerves, also, had undergone rather marked degenerative change, but evidence of a previous inflammatory process was not found. These degenerative processes were most marked in the nerve roots, between the spinal cord and the dorsal root ganglia. Evidences of degenerative change were also noted in the anterior roots. The left sciatic and left femoral nerves were the most involved, but all the nerves of the lower extremities had undergone definite changes. The spinal cord was not injured, except for a region of degenerative change in the posterior columns of the medulla oblongata and in certain regions of the posterior spinal cerebellar tract.

The final anatomic diagnosis was: (1) anterior gastro-enterostomy for duodenal and gastric ulcer, (2) duodenal occlusion, (3) ulcerative colitis, (4) terminal bronchopneumonia, and (5) degenerative changes of the central nervous system somewhat suggestive of those seen in beriberi.

COMMENT

The principal interest attached to this case lies in the unusual combination of symptoms of the so-called deficiency diseases. The glossitis, pigmentation, and mental disturbances suggested pellagra, whereas the peripheral neuritis, edema, ascites, and sudden death were more or less characteristic of the wet form of beriberi. The changes found at necropsy, particularly those noted in the central nervous system, were comparable to those reported in beriberi. The combination of evidences of various conditions in this case appeared to be unique and were difficult of explanation.

Although opinion is not unanimous, pellagra and beriberi both have been thought to be due to deficiency of Vitamin B. There is a general belief that Vitamin B contains more than one active principle, and Goldberger has maintained that it contains a specific factor which prevents pellagra. The dry type of beriberi probably is due to Vitamin B deficiency alone, and it has been produced experimentally in animals. The wet type probably is due to a combination of deficiency in Vitamin B and low intake or reduced assimilation of protein with subsequent reduction of the serum proteins.[2] Because of the mental disturbances of the patient whose case has been presented, it was difficult to determine exactly in what respect his diet had been deficient, but it is fairly certain that during a large portion of his illness he had taken only concentrated and artificial foods. He had largely avoided fruit and vegetables and he had taken meats only in limited quantities. He had also suffered with vomiting and diarrhea to such an extent as to interfere with the assimilation of such foods as he actually had ingested. These latter factors may explain the low level of serum protein and the edema. The other deficiency symptoms were probably due to a combination of inadequate diet, vitamin deficiency and the disturbed physiologic mechanism of the gastro-intestinal tract.

The case may be said to present an end-picture of the effect of inadequate diet on a patient whose pancreatic ferments and bile were diverted into the stomach and through it by means of gastro-enterostomy. This condition, together with the ulcerative colitis, undoubtedly produced the abdominal symptoms of which he complained. The nature and cause of the duodenal occlusion remains a mystery. It may represent the result of operative trauma or the end-stage of an obliterative inflammatory process. Pathologic examination gave no further clues as to its nature. The ulcerative colitis, which played so large a part in the production of symptoms, had some of the appearance of a terminal condition. However, bacteriologic studies were not made and it was impossible to exclude the possibility that the patient had suffered with an infection by the diplococcus of ulcerative colitis. In this connection it must be recalled that in other deficiency diseases ulcerative lesions of the bowel have been described and that in pellagra supposedly specific types of colitis have been said to exist.

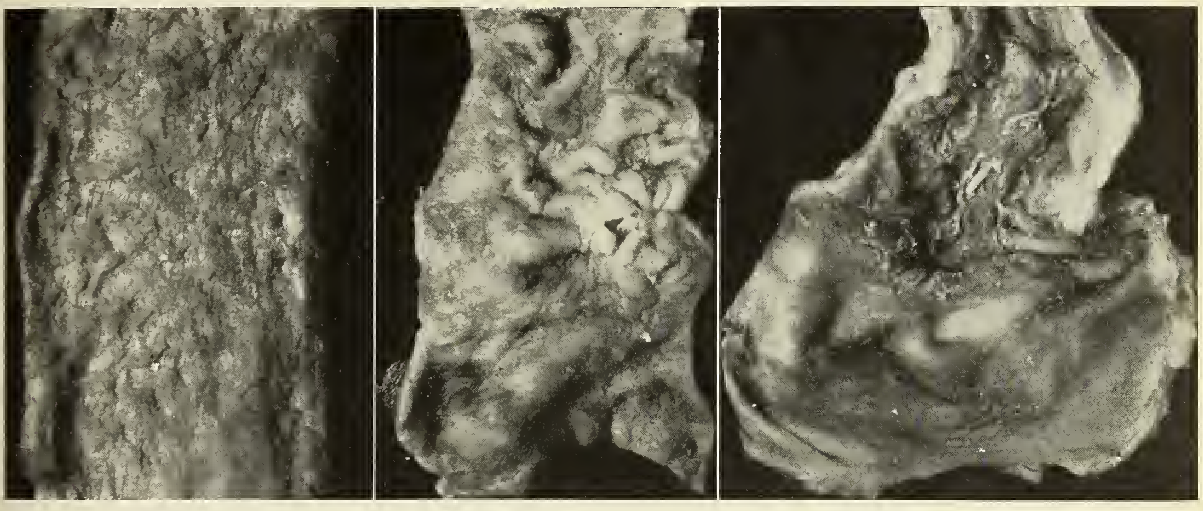


Fig. 3. Sections of the colon. There is evidence of ulcerative colitis and a pseudomembrane.

It is interesting to speculate as to the possible physiologic effect of duodenal occlusion below the papilla of Vater in the presence of gastro-enterostomy. In normal animals which have been fed on laboratory food this does not produce very significant nutritional effects, although it has been known to cause jejunal ulcers.[1] In the presence of high gastric acidity such as this patient probably had in the early stage of his disease, it is possible that the pancreatic ferments were inactivated and that this was responsible for the original diarrhea.

The manner in which disturbances of gastro-intestinal function act to produce deficiency syndromes is, of course, not entirely understood. That such syndromes do occur is a well established fact. Eusterman and O'Leary recently reported a series of cases in which pellagra was secondary to obstructive gastro-intestinal lesions, or, as in one case, to ulcerative colitis. Symptoms not unlike those of beriberi have been encountered at the clinic, usually in cases of profound nutritional disturbances of long standing. Inanition edema likewise has been observed at the clinic[7] and Landis, and Leopold, and Wolferth previously reported similar cases following gastro-intestinal disturbances. The connecting link in all of these groups of cases seems to be the combination of an inadequate diet, usually low in protein, with some gastro-intestinal lesion which interferes with the assimilation of food. What portions of these syndromes can be attributed to deficiency in Vitamin B alone is difficult to determine, but, as Minot has claimed, a multiplicity of factors may enter into the etiology of any deficiency disease of this type. It is apparent that a search for symptoms of deficiency disease should be made in any case in which, because of gastro-intestinal disease, the patient has subsisted on a restricted diet, since it is not unlikely that many mild or borderline deficiency syndromes now escape attention.

BIBLIOGRAPHY

1. Bollman, J. L.: Personal communication to the author.
2. Cowgill, G. R.: Some physiological and biochemical aspects of deficiencies with special reference to Vitamin B. Ann. Int. Med., 3:230-241 (Sept.), 1929.
3. Eusterman, G. B., and O'Leary, P. A.: Pellagra secondary to benign and carcinomatous lesions and dysfunction of the gastro-intestinal tract: report of thirteen cases. Arch. Int. Med. (in press).
4. Goldberger, Joseph: Present status of our knowledge of etiology of pellagra. Medicine, 5:79-104 (May), 1926.
5. Landis, E. M., and Leopold, S. S.: Inanition edema associated with tuberculous enteritis. Jour. Am. Med. Assn., 94:1378-1381 (May 3), 1930.
6. Minot, G. R.: Some fundamental clinical aspects of deficiencies. Ann. Int. Med., 3:216-229 (Sept.), 1929.
7. Snell, A. M.: Inanition edema following surgical relief of pyloric obstruction. Proc. Staff Meetings of Mayo Clinic, 5:192-194 (July 9), 1930.
8. Wolferth, C. C.: Inanition edema associated with alimentary disturbances in adults. Med. Clin. N. Amer., 8:785-801 (Nov.), 1924.

DEATH FROM EXPLOSION OF MIXTURE OF ANESTHETIC GASES

It has been two years since, at Evansville, Ind., a tank containing nitrous oxide exploded, killing an anesthetist. Last month a patient died on the operating table in Los Angeles because of the explosion of an anesthetic mixture. Yet the hazard from an explosion of anesthetics is probably less than that of fatally persistent hiccup. It has been pointed out that surgeons and anesthetists need far more to utilize means to prevent postoperative pneumonia than to worry over the hazards of explosions, except, of course, explosions due to carelessness. In the case of the Los Angeles accident, the patient was given nitrous oxide and oxygen, followed by ether. It has been pointed out repeatedly that a mixture of these gases is explosive. Explosions recorded heretofore appear to have been due to sparks from discharges of static electricity. Various committees of the American Medical Association have reported on precautions that are to be taken towards the prevention of such accidents. Jour. A. M. A., February 14, 1931, p. 530.)

KOREMLU, A DANGEROUS DEPILATORY

There has been on the market for some time a depilatory sold under the name "Koremlu Cream," marketed first under the trade name "Kora M. Lublin," more recently under the style "Koremlu, Inc.," both of New York City. According to the advertising, Koremlu is "guaranteed to devitalize superfluous hair roots on face or any part of the body." From information received it was quite apparent that Koremlu contained thallium acetate. Reports of serious effects of the use of Koremlu Cream have been reported that are typical of thallium poisoning. The A. M. A. Chemical Laboratory analyzed the preparation and concluded that it consisted essentially of an ointment containing approximately 7 per cent thallium acetate and 9.5 per cent of zinc oxide. Dr. Sabourand, who studied the effects of thallium as a depilatory, declared that any ointment containing more than 1 per cent of thallium acetate is dangerous. He cautioned that but small amounts of the one-per-cent ointment should be used at one time; no limit is given to the amount of Koremlu, which is much stronger, that should be applied. (Jour. A. M. A., February 21, 1931, p. 629.)

TWO CASES OF PELLAGRA FROM MINNESOTA

ONE WITH THE SYNDROME OF PROGRESSIVE MUSCULAR ATROPHY

HUGO O. ALTNOW, M.D.*
Minneapolis
and
HERMAN H. JENSEN, M.D.
Atwater, Minnesota

PELLAGRA was first recognized in the United States in 1902.[1] In 1914 it was estimated that there were 165,000 cases in the United States. The original pellagrous area comprised the South Atlantic states, but since its recognition, cases have been reported from practically every state in the Union. Many more cases may be recognized if it is borne in mind that any case of severe and obscure nutritional disturbance may be pellagra.

In Minnesota and the neighboring states, Head[2] reported one case from South Dakota, and O'Leary[3] of the Mayo Clinic reported thirty-four cases seen in four years, coming from the middle western and northwestern states, including three from northwestern Canada. Granger[4] in 1918 reported five cases, three of which developed in Minnesota and North Dakota. Sweitzer[5] reported seven cases in chronic alcoholics in Minnesota. Briggs and Ruhberg[6] reported two cases in alcoholics. Marsh,[7] McIntosh and Blount,[8] and Middleton,[9] reported one case each from Wisconsin. Marsten and Warren[10] noted four cases from Wisconsin, and Ely[11] recorded two cases from Iowa.

For a brief review of the etiology of pellagra, we have drawn largely upon Goldberger's excellent account[12] of the various theories concerning the origin of the disease.

Three to four centuries ago, pellagra was considered to be due to poor food. A later theory attributed the disease to the deficient and poor quality of protein in the diet of people eating corn. This idea was abandoned when pellagra was discovered in individuals whose diet contained no corn. For a long time the theory was accepted that pellagra was caused by toxic changes in the food, especially in corn, due to the action of microörganisms that were nonpathogenic to the individual, but produced a toxin. Following this, the students of the disease were divided into two groups, one of which advocated the infectious and the other the dietary theory of the origin of the disease. The former group based their contention chiefly on the following grounds: (1) abrupt appearance and extension of the disease and its limitation to the south; (2) seasonal character; (3) occurrence in the well-to-do with liberal diet, and in well nourished individuals. The second group gave as reasons for supporting the dietary theory: (1) no contraction of the disease by attendants in hospitals; (2) response of patients to proper diet; (3) complete prevention by proper diet; (4) inability to transfer disease by inoculation of well persons with secretions of diseased individuals.

In 1912, Funk stated that it was a deficiency disease: an avitaminosis. He maintained that the milling process removed an essential vitamin from the corn. He was probably the first to recognize the true character of the disease, but his premise concerning the mechanism by which it was produced was not correct.

Since the dietary has succeeded the infectious theory, the recent researches of Goldberger, Wheeler, Lillie and Rogers[13] have quite conclusively established the following facts: (1) that pellagra is due to deficiency of a vitamin called the P-P factor, which comes from the same sources as those associated with Vitamin B; (2) that this is not identical with the anti-neuritic factor of Vitamin B; (3) its chief food sources are yeast, fresh meat, butter, milk and vegetables; (4) it acts as a pellagra preventive and pellagra cure without the help of protein.

However, not all observers of this disease are ready to accept the above facts as final and for a controversial opinion the reader is referred to the discussion of Wilson.[14] Wilson does not accept the results of the animal experiments of Goldberger and his associates as far as considering "black tongue" in dogs and the dermatitis of rats brought about by a deficiency of the P-P factor in the experimental diets as being pellagra. He believes that the essential cause of pellagra is a primary or secondary deficiency in the value of the protein intake relative to individual requirement, a requirement which may be raised by various conditions. He does not consider a deficiency of the vitamin factor in itself as ever being sufficient to produce the disease.

---

*From the Department of Medicine, The Nicollet Clinic.

The following cases were first seen by one of us (H. H. J.) in a single locality in Minnesota:

Case 1.—The patient was a housewife, aged 34, who complained of generalized body pain, loss of strength and inability to move about, and swelling of the face.

Her family history was essentially negative.

The patient's appendix and an ovarian tumor were removed in 1917. In 1918 she had severe influenza and suffered from palpitation and tachycardia for the next two years. In 1919 her tonsils were removed. In March, 1927, seven teeth were extracted.

The patient was married for twelve years. Her husband was living and well and she had two children, eleven and seven years of age. One miscarriage occurred in 1918.

The present illness started in February, 1927, and was gradual in onset. The patient first noticed redness and burning of her face, and, a little later, puffiness of the face, particularly under the eyelids. Her face was swollen at the time of examination in June, although not so much as formerly, and the dermatitis was more pronounced. In March she had experienced difficulty in using her left arm and shoulder. Shortly thereafter the same difficulty appeared in the right arm. This later extended to the hands, particularly the left. In April she developed weakness in the right thigh, a little later in the left, and then in the legs. Numbness in the dorsum of the left foot was felt at different times. For two months she had increasing difficulty in swallowing, with regurgitation of liquid food. Her neck was very weak and she was unable to lift her head from the pillow. She had a rather severe, non-productive cough for two weeks. At the onset of the illness she felt hungry all of the time, but later her appetite was only fair. Since 1918 she had had attacks of epigastric pain, with diarrhea. After the onset of the present illness her bowels moved two to four times a day. She could not sleep well because of pain in the legs and nervousness.

Physical examinations showed the patient to be moderately undernourished with hard edema or swelling of the forehead, eyelids, malar regions, upper lip and ears. The swelling was greater on the right side, producing asymmetry of the face. The skin over the swollen part was rough, dry, scaly and dark from increased pigmentation. Dermatitis was present over the neck and anterior upper aspects of the thorax. In the latter location there was no pigmentation and the color of the skin was dark red. The distribution was bilateral and symmetrical, producing a "butterfly wing" appearance. The same dermatitis was present on the dorsal aspects of the fingers, hands, wrists and lower third of the forearms. Here the symmetrical distribution was even more striking than on the thorax, one side being a perfect mirror pattern of the other.

There was reddening (stomatitis) of the mucous membranes of the mouth and tongue. The muscles of the tongue showed atrophy and there was inhibition of movement of the muscles of the soft palate. Several teeth had been extracted and the remaining teeth were in good condition. The tonsils were well removed. There was a systolic murmur at the apex. Moderate fixation and pain occurred on flexion of the joints. There was general tenderness of the skeletal muscles and long bones on pressure. The temperature was 98.6, pulse 96, blood pressure 108/50. Since the patient could not stand on the scales, her height and weight were not obtained. Otherwise, the physical examination was negative.

The blood examination showed the following: hemoglobin 67; RBC 4,280,000; WBC 4,900. Differential blood count showed leukocytes 24.5; mononuclears 4; polymorphonuclears 71; eosinophiles 0; basophiles .5.

The patient was admitted to Abbott Hospital for further study. A neurological examination was made on admission by Dr. Angus W. Morrison. The face was asymmetrical, due to unequal edema. There was no apparent involvement of the seventh nerve. There was some atrophy of the muscles of the tongue, as the mucous membrane of the sides was thrown into folds. The movements of the tongue were weak. Effort produced only a very slight elevation of the palate. There was distinct atrophy of thenar and especially hypothenar groups of muscles on both sides, but it was much more marked on the left. There was a more definite hollowing of the first interosseous space, especially on the left side, and of the other interosseous spaces than is usual. All motions could be performed, but there was marked weakness in gripping, abduction and adduction of the fingers and particularly in approximating the thumb to the little finger, more marked on the left than on the right side. There was loss of tone of all muscles of the extremities, with atrophy of flexor groups in the forearms. Movements of the elbows and shoulders could be carried out, but were weak, and there was some limitation in action, due to what appeared to be shortness in the biceps tendon and limitation in adduction of the shoulder joint, particularly on the left side. There was no marked atrophy of supra- and infra-spinatus muscles. The neck muscles were extremely weak, the head falling in one direction or another. All movements of the lower extremities were weak and there was some atrophy of external peroneal groups. All movements could be performed. The biceps and triceps were barely present and equal. Knee jerks were not obtained. The left ankle jerk was greater than the right. Abdominal reflexes were all present, but the right tired more easily than the left. Both lowers disappeared on repeated tests. Sensory examination was negative. Deep sensibility and joint sensation were normal. The tentative diagnosis was progressive muscular atrophy with bulbar palsy. On June 12, 1927, the patient was seen by a consultant in dermatology, Dr. H. E. Michelson. In his diagnosis he considered the following possibilities: (1) pellagra;

(2) disseminated lupus erythematosis; (3) edematous stage of scleroderma. Absence of temperature and acute onset completely ruled out disseminated lupus erythematosus. The edematous stage of scleroderma was rejected because of the color of the involved area and the non-resistant character of the edema. The dermatitis, stomatitis, apathetic state and intestinal symptoms all pointed to pellagra.

On June 7, the urine reaction was alkaline, with specific gravity 1.019, no albumin or sugar, sediment, 10-15 pus cells per H. P. F. and no casts.

One June 9, the sugar tolerance with 100 G. glucose was fasting sugar 100 mg. per 100 c.c. the first hour and 134 mg. per 100 c.c. the second. An X-ray examination of the long bones and joints showed decalcification. There was no evidence or arthritis. The changes were apparently due to disuse atrophy.

An examination of the stool on June 10 showed it to have an offensive odor with alkaline reaction, undigested food, and no ova or parasites.

On June 11 the blood examination showed WBC 7,100, with a differential count of 25 leukocytes, 68.5 polymorphonuclears, 7 mononuclears, no eosinophiles and 0.5 basophiles.

The patient remained in the hospital one week. She was placed on a high protein diet with an abundance of green and cooked vegetables. Her afternoon temperature varied between 99.2 and 99.8, and her pulse rate from 100 to 104.

Several months later she entered a sanitarium, where she died on November 11, 1927, about six months after she first came under our observation.

Autopsy by Dr. E. T. Bell was limited to abdominal incision. The body weight was estimated at 99 pounds. There was brownish pigmentation of the face and neck, with a triangular area down on the thorax. There was no pigmentation of the arms or legs. The organs of the chest and abdomen were essentially normal, except for terminal bronchopenumonia of the right lung. His diagnosis was: (1) pellagra; clinical; (2) terminal broncho-pneumonia.

Because of the advanced muscular atrophy and the helplessness of the patient, the first clinical impression did not particularly suggest pellagra, but the stomatitis, gastro-intestinal symptoms, symmetrical dermatitis and central nervous system degeneration could be explained only on this basis. We had come to this conclusion, independently, although at the time we were not familiar with such marked central nervous system degeneration occurring in the course of pellagra. We have not found this feature of progressive muscular atrophy with pellagra reported in the literature. Spastic paraplegia, ataxia and marked muscular weakness have been described.

Wood[14] states that one of his fatal cases presented a classical picture of acute Landry's paralysis and cites Kinnear Wilson as mentioning neurological findings in pellagra having a marked resemblance to subacute combined degeneration. Wood also states that in some cases the neurological aspect is typical of subacute combined degeneration. He further cites Neusser as describing a case of amyotrophic lateral sclerosis occurring with pellagra and the inference that it was of pellagrous origin, "but such would hardly be accepted without more evidence."

Roberts[15] points out that spinal cord lesions fall into three groups: (1) probable pyramidal tract degeneration. He quotes other students of the disease as stating that muscular atrophy of some degree occurs in approximately 50 to 60 per cent of the cases. This involves extensor more than flexor groups, often producing contractures.

The case of Middleton[9] had fibrillary tremors and speech and deglutition difficulty, suggesting anterior horn and bulbar involvement.

Aside from this, Cuno[16] reports the case of two brothers, fourteen and twelve and a half years of age, in whom progressive muscular atrophy was present. Both showed marked improvement and one almost complete rehabilitation after being fed yeast, codliver oil and a vitamin-rich diet. He regarded a possible avitaminosis as the cause of the nervous lesions.

In investigating more closely the dietary habits of the patient above reported, it was found that during the year prior to the onset of the disease the patient had lived on a farm in South Dakota; there had been a complete crop and garden failure, and the patient's diet had consisted largely of potatoes, bread, eggs, and pork with only a little milk and very few vegetables.

Case 2.—This patient was a farmer, sixty-two years of age.

Since 1916 he had had three attacks of manic-depressive psychosis. The last one was in 1923 and was the most marked, lasting for about six months.

The patient was admitted to Abbott Hospital September 15, 1928, complaining of weakness, diarrhea, loss of weight, anorexia and insomnia. His brother-in-law stated that the patient had not been feeling well since April of that year. About the first of July he developed loss of appetite, sleeplessness and restlessness. He began to show definite evidence of a psychosis and mental depression. About one week later he developed diarrhea, which was present to some extent in the community. Vomiting began about the first of September and the patient took nothing to eat except a little orange juice until he entered the hospital. The vomitus was green at first, and later brown and foul smelling. The patient stated that his stools had been dark and tarry and that he had lost about twenty-five pounds.

Physical examination showed the patient to be greatly emaciated and dehydrated, and somewhat confused and disoriented. There was hyperemia of the hard and soft palate. The tongue was smooth and red, with ridging at the center and lateral furrowing. The pharynx was reddened and adhering to it was a stringy, white exudate, similar to an exudate appearing on the palate.

The lungs were hyperresonant, with dry râles under each clavicle and sibilant râles at both bases in the mid-axillary line. The heart tones were poor, with some irregularity in rhythm. The abdomen was scaphoid and tender. No mass was felt and there were no enlarged lymph glands or rectal shelf.

There was a brown, spotted pigmentation, similar to freckling, on the dorsum of both forearms, extending to the elbow. On the back of both hands there was an irregular area about 10x10 cm. which was smooth and pink and seemed to be due to peeling of the brown skin. The distribution and shape on the hands was symmetrical. There was pigmentation encircling the neck, similar to that on the forearms. The skin of the nose was rough, pigmented and slightly red at the tip. The skin over the elbows and knees was also rough and pigmented.

A Van Slyke test on the day of admission registered 48 per cent, and a non-protein-nitrogen test 54.5 per cent.

During the first thirty-six hours after admission the patient was given 4,000 c.c. of 5 per cent glucose and the vomiting stopped. A tentative diagnosis of pellagra was made on admission, and as soon as the vomiting had stopped, raw beef juice, yeast and orange juice were given.

On September 17, a gastro-intestinal examination showed no free hydrochloric acid in the stomach contents. On fluoroscopic examination the pyloric end of the stomach did not fill. Six hours later the same findings were present and the cardiac end of the stomach was still filled. There appeared to be a trickle of barium to the pylorus.

The patient took food well for two days, then he resumed vomiting and his mental condition became so much worse that it was impossible to feed him. On each succeeding day he showed more exhaustion and on the eighth day he developed a pulmonary edema and died.

An autopsy was performed by Dr. J. S. Harter of the Department of Pathology, University of Minnesota. The essential findings were as follows: Pigmentation was present as described above. The right pleural cavity contained 200 c.c. of straw-colored fluid and the pericardial sac contained 250 c.c. The lower lobes of both lungs were edematous and congested on section. The stomach and gastro-intestinal tract were normal except for three diverticulæ in the upper portion of the jejunum. The pathological diagnosis was pellagra.

When this patient was first seen by one of us (H. H. J.), he was thought to be suffering from a carcinoma of the stomach. On admission to the hospital the two patches of dermatitis were noticed on the back of the hands. On inquiry, it was learned that this dermatitis had recurred for three previous summers. This established the photo-sensitive character of the condition and suggested the possibility of pellagra. The gastro-intestinal and X-ray findings appeared to confirm the diagnosis of a co-existing carcinoma of the stomach. Opposed to the latter diagnosis were the absence of pain and the fact that no palpable tumor could be felt in the abdomen, where it should be almost visible. Because of the patient's weakened physical condition, the fluoroscopic examination was difficult and unsatisfactory. Plates were not made. In view of the postmortem findings, it must be concluded that the lack of filling of the distal half of the stomach was due to pressure of the spine.

The dietary habits of this patient were excellent and he was not an alcoholic. He must be considered as one of the rather infrequent cases of pellagra designated as the idiopathic type, whose eating habits show no evidence of gross dietary deficiency. His last attack of manic-depressive psychosis with anorexia and diminished food intake was no doubt a precipitating factor in bringing on the terminal stage of the disease, although it was not entirely responsible, since his history reveals the fact that the cutaneous manifestation was present for at least three years before the terminal illness.

REFERENCES

1. Niles, Geo. M.: Pellagra an American Problem. W. B. Saunders and Co., Phila., 1916.
2. Head, G. E.: Case of pellagra—its bearing on etiology and cure of disease. Arch. Int. Med., 34:93, 1924.
3. O'Leary, P. A.: A study of 34 cases in locality where pellagra is not endemic. Northwest Med., 27: 319, 1928.
4. Granger, C. T.: Pellagra. Journal-Lancet, 38:95, 1918.
5. Sweitzer, S. E.: Pellagra and alcoholism. Minn. Med., 11:719, 1928.
6. Briggs, J. F., and Ruhberg, Geo. N.: Pellagra following alcoholism. Minn. Med., 12:374, 1929.
7. Marsh, H. E.: Pellagra in Wisconsin. Wis. Med. Jour., 21:413, 1923.
8. McIntosh, R. E., and Blount, W. P.: Pellagra occurring in Wisconsin. Wis. Med. Jour., 25:338, 1926.

9. Middleton, W. S.: Occurrence of pellagra in Wisconsin. Wis. Med. Jour., 23:503, 1925.
10. Marsten, Mabel G., and Warren, E. D.: Four cases occurring in Wisconsin. Wis. Med. Jour., 28:419, 1929.
11. Ely, F. A.: Pellagra. Jour. Iowa Med. Soc., 8:388, 1918.
12. Goldberger, J. O.: Pellagra. Tice, Practise of Medicine, 10:205.
13. Goldberger, J. A., Wheeler, G. A., Lillie, R. D., and Rogers, L. M.: Further study of butter, fresh beef and yeast as pellagra preventives with consideration of relation of factor P-P of pellagra and black tongue of dogs to Vitamin B. Pub. Health Rep., 41:297, 1926.
14. Wood, E. J.: Pellagra. Oxford Medicine, Cambridge Univ. Press, 4:344.
15. Roberts, S. R.: Pellagra; History, Distribution, Diagnosis, Prognosis, Treatment, Etiology. C. V. Mosby and Co., St. Louis, 1912, p. 152.
16. Cuno, F.; Juvenile muscle atrophy and avitaminosis. Deutsche med. Wchnschr., 50:1188, 1924.

ROOMS OF RAMSEY

A ride in a swift green elevator brought the Hennepin County visitor to the top floor of the new Lowry Medical Arts Building in Saint Paul, where the Ramsey County Society held open house in their new rooms February 27, 1931. Creamy plaster walls and walnut woodwork give a sense of restful dignity. A delightful antique table in the periodical room is surrounded by chairs covered with woven straps of pigskin. Cretonne window drapes, gay but not too gay, and a perfectly luscious armchair conspire effectively to make the reader feel at home. Soft oriental rugs seem to be everywhere. The walnut Windsor chairs in the main reading room are of the heaviest construction so that even the most corpulent of the local profession can sit in one for hours at a time without fear of collapse. The library stacks are arranged on two floors, and there are study cubicles under the windows with walls so high that full privacy is assured the occupant unless he stands up and cranes his neck out.

The auditorium has rough, creamy plaster walls with pilasters of ivory, and rich blue-green window draperies. The lighting fixtures, specially designed, are modernistic in effect, but cunningly escape boldness. The softly frosted glass eliminates glare without casting shadows and gives a sense of friendly brightness to the room. Handsome display cases are built into the wall of the corridor and of the auditorium for the collection of old books and instruments which has been arranged chiefly by Dr. John Armstrong. One case contains a remarkable array of nursing bottles, loaned by Dr. Robert Rosenthal, including a pottery one from Rome, antique china, glass and silver ones from Europe and Colonial America. Of interest is a flat silver nipple which can be plugged into any cork. Thus any bottle can be gotten up to tempt the infant appetite, but scarcely to deceive it. Old books, rare books, were in every case. Especially noteworthy was a collection of book treasures on ophthalmological subjects loaned by Dr. Frank E. Burch.

Dr. O. W. Holcomb, the newly elected president, sat at the table on the platform, flanked by Drs. Justus Ohage, Wm. Davis, H. Longstreet Taylor, Jennette McLaren and J. C. Markoe, early members of the Ramsey County Society. Dr. John Armstrong sketched the beginnings of the Society and called attention to the bronze name plates of the founders which had been placed in the entrance lobby. The meeting place of the first eight members in 1870, in a small dark room over a beer saloon, was contrasted with the present quarters, and the important steps taken by the Society in the intervening years were traced. Dr. H. Longstreet Taylor outlined the beginnings of the library when the members of the committee spent Saturday afternoons collecting books and periodicals from the homes of the local doctors, aided and abetted by the good housekeepers who presided there. A week-end horse and buggy trip to the southern part of the state yielded a valuable collection of library material, although it and the committee members were nearly lost in the mud and rain of the unfenced roads between the infrequent farm houses on the night trip homeward. The late Dr. Edouard Boeckmann, whose method of making catgut, bequeathed to the Society, has so generously provided for its financial needs, was cited for his loyalty, enthusiasm and vision which, manifested throughout his lifetime, still continues to influence the progress of the Society. Dr. John Armstrong and Dr. Frank Burch were characterized as the latter-day saints of the library because of their devotion to its development.

The guest speaker of the evening, Dr. Alfred Brown, Omaha, associate professor of surgery, University of Nebraska, delivered a fluent and scholarly address on the development of surgery after the crusades, emphasizing particularly the influence of the medicine which had been brought to Europe from the Orient, and its spread from the center at Salerno.

The attractive buffet supper which was served in the auditorium at the close of the meeting emphasized the feeling of hospitality and friendliness which was evident throughout the evening. Ramsey County Society seemed to say, "This is our medical home, and we are glad to have you enjoy it with us."

O. S. H.

Who would exchange walnut woodwork with "creamy plaster" (and frosted glass) for the oak tables, sawdust, and stench of lager of olden days?—Ed.

(*Bull. Hennepin County Medical Society,* Mar. 10, 1931.)

COSAS MEDICAS FILIPINAS
(Philippine Medical Affairs)

Ralph T. Edwards, M.D.
Elysian, Minnesota

IN the Philippine Islands, situated in the oriental tropics, most oriental and tropical diseases prevail. However, there are two notable exceptions. Yellow fever has never been found, though the specific mosquito carrier abounds. Infection from South and Central America has been escaped probably because of the long time required for sailing ships to span the Pacific over the ordinary trade routes. In modern times quarantine regulations prove an effective barrier. Nor have there been any cases of human trypanosomiasis or true sleeping sickness, but this is more easily explained as the insect carrier, the tsetse fly, does not exist in the Philippines. However, surra (enzoötic trypanosomiasis) is common, though it has not been known to attack man.

It is not uncommon to wade through a foot of water to reach the Manila streetcars, such rains assisting greatly in the sanitation of ground high enough for drainage, but much of the six foot annual rainfall comes in daily showers through the wet season, just enough to keep the lowlands wet and steamy, an ideal incubation for filth diseases.

As here, so there, in the dry season dust-borne diseases prevail. The great amount of sunshine and the beautifully ventilated houses cut down the rate for tuberculosis, pneumonia, scarlet fever and diphtheria, though smallpox is especially severe.

Most of the country is low enough to have a tropical climate, but to the north of Manila is Baguio, the health capital of the Islands, which, on account of its altitude, is almost temperate in climate.

As in the southern part of this country, and in most of the Orient, so in the Philippines, agriculture plays an important part in health conditions. Rice is the chief cereal food. In fact, no other cereal could be raised in sufficient amount to take its place. Rice is planted, and for weeks grows in standing water, with accompanying mosquito and malaria breeding. One may stand on a hillside and see both sides of the valley terraced into little level fields with rice growing in standing water, then turn and see Manila cut up by canals and the river, a beautiful sight. However, were it not for the fact that everyone sleeps under a mosquito net, the malaria deaths would be appalling. One must acquire considerable skill to get into bed without allowing mosquitos to enter the canopy at the same time. I have seen as many as 275 mosquitos on one side of the canopy waiting for a victim. In addition to serving as breeding places for mosquitos these rice fields also harbor the hosts of at least two kinds of flukes.

Carabaos, Hindu humped cattle, and native cattle stand surra or enzoötic trypanosomiasis very well, but do not give much milk. Western cattle are very susceptible, thus making dairying hazardous and fresh milk so dear that few natives can afford it. The milk of the water buffalo is used to some extent by the natives for infant feeding, but is so scant and highly concentrated as to be of little help. These primary supplies are supplemented by many brands of condensed and some of sterilized milk, most of it coming from Holland. Nevertheless, the native family, living on from fifty cents to one dollar per day, and improvident in the extreme, often suffer from vitamin insufficiency, and the baby, least able to tell its troubles, suffers first.

Beri-beri, a B avitaminosis, was formerly rampant and half the babies died the first year. Science has not only proved, by much experimental and clinical evidence, that beri-beri is an avitaminosis, but now has a definite specific cure in tique-tique (tiki-tiki), an extract of rice husk, now manufactured extensively in Manila for the prevention and cure of this plague of the Orient (Fig. 1).

Sunshine, with abundance of fruits and vegetables, acts as a preventative of rickets, so that in a recent year, among over 35,000 admissions to the Philippine General Hospital, there was not a single case of rickets and but few of scurvy, mostly from the shipping trade, but there were ninety-nine admissions for beri-beri.

At the time of the American occupation, the native city of Manila was in a swamp, especially during the rainy season, though the walled city was dry, as were also some of the suburbs.

The accompanying cut of a typical native outhouse (Fig. 2) shows how, in the wet season, any food-borne pestilence would spread. For the same reason tinea soleum throve whether the season were wet or dry, as pigs had free access to the droppings and were not at all backward about answering the call to lunch. Under American rule this has been done away with in Manila, and will, in time, be changed throughout the Islands, though under Spanish rule "It is the custom" made it perfectly right.

During the rainy season mosquitos are a veritable plague, with accompanying malaria, dengue or break-bone fever, and other mosquito-borne diseases, yet the native took no precautions except that the whole family slept under a common mosquito net, putting it away in the morning to make room for the daytime use of the house.

To raise Manila out of the mud is no small task, but it is being done. There is a saying that "The Constitution follows the Flag," but perhaps we had better say that good roads follow, because travel and commerce must have roads. The streets were filled with rock, with a crushed rock surfacing. Philippine rock being soft, this surfacing soon becomes mud, is scraped off and used to fill low places in the city while trainload after trainload of crushed rock is added to the streets.

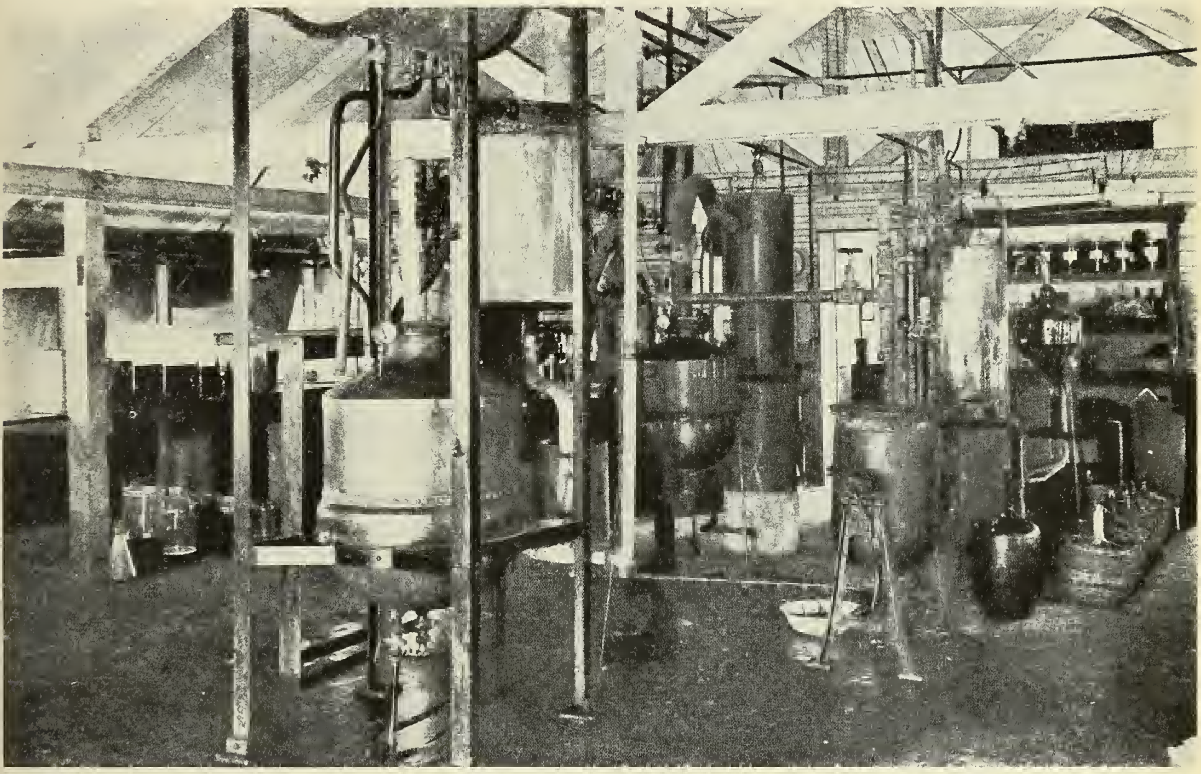


Fig. 1. Tikitiki-extraction plant, Manila.

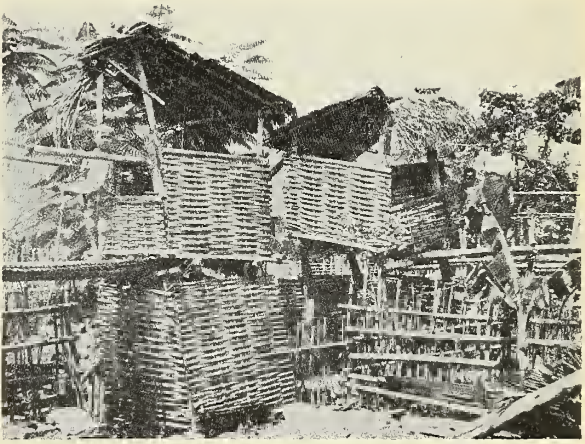


Fig. 2. Typical outhouse.

Sea commerce, like that on land, also demands better facilities. Formerly ocean-going ships were compelled to stop out in the bay and transship their cargoes to casgoes or barges of light draft which could go up the river to the customs house. A great sea wall was built a mile or so out in the bay with a gap for a harbor entrance. A square mile of the bay next to the city was enclosed in a wall, and the centrifugal dredge "Manila" filled that square mile with mud from the harbor, and now passengers walk directly onto the decks of ocean-going steamers. Even this did not make enough harbor, so another 160 acres was walled and filled with harbor dredgings and possibly more fills will follow. On the first square mile are government buildings fitting for the chief seaport of the Islands; on the second fill are various semi-public enterprises: the Manila Hotel, the Elks Club, the Army and Navy Club, the University Club, etc., so that, instead of approaching low dingy mud flats, one now meets "modern Manila."

Low spots in the city were too far away to be filled from the bay, so, when these harbor fills were completed, the dredge improved the river and threw the dredgings into the moat about the Spanish walled city and into other low districts near the river. Then much of these dredgings was hauled to low places too far for the dredge to throw and through the middle of this filled district runs Taft Avenue, flanked by the Y. M. C. A., the Columbia Club, the University of the Philippines, the Philippines General Hospital, and the Bureau of Science, signs of a modern healthful city, and Manila is coming up out of the mud.

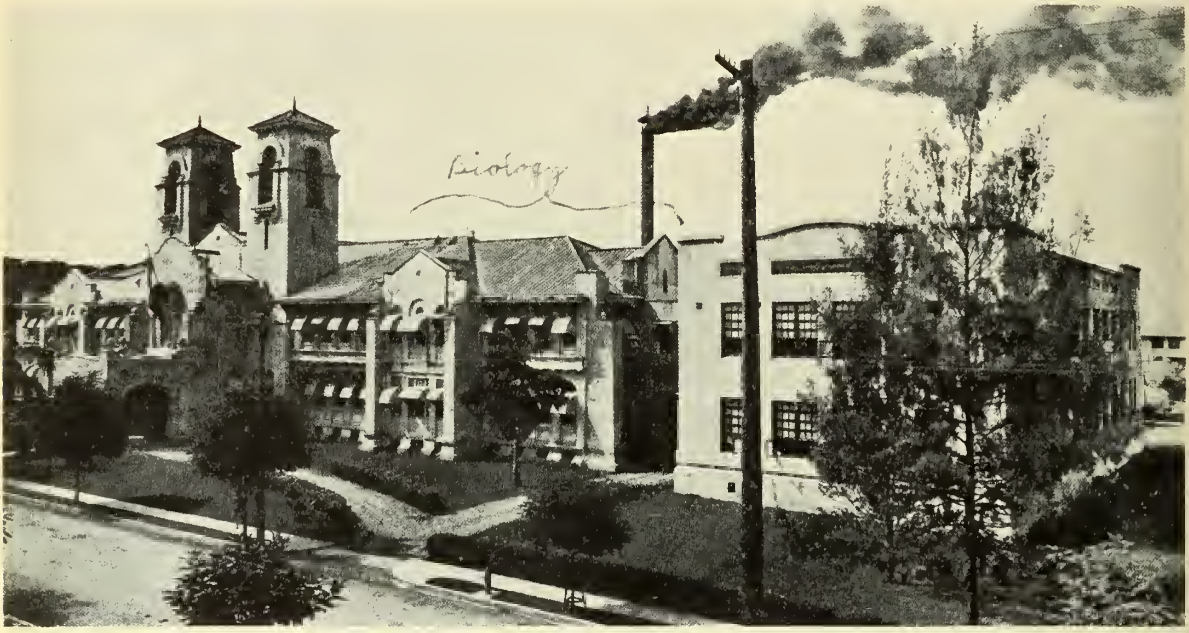


Fig. 3. Main building and east wing, Bureau of Science, Manila.

As there are some fifty or more dialects spoken in the Islands, and as education had up to the time of occupation been only in reach of the "classes," America began the task of educating the "masses." Spanish was the official language of the country, but spoken only by those who could afford school. Schools were established wherever possible with American teachers, teaching only in English, to make a common language. In a few years young Filipinos began teaching under American supervision and more schools were established. Now elementary grammar and high schools lead to normal school or college and the University according to the aspiration of the student. In 1927 there were over a million enrolled in the elementary schools and over 6,000 in the University. This does not equal the present showing in Minnesota, but it is not probable that many states in the Union have made a better showing even thirty years after admission to statehood. Educationally also it is evident that Manila is coming up out of the mud, with higher intelligence making for better health.

In addition to these external means of improving the city's health, there are two bands of men in charge of making the city, and in fact the whole insular group, healthful.

The Bureau of Health works much as a state board of health, their work modified by peculiarities of place and people.

The Biological Department of the Bureau of Science consisted, in 1906, of eight Americans and ten or twelve Filipinos whose duty it was to study plants, animals and men, dead or alive, with the aim of advancing the science of health, more especially of man, but also of plants and animals. Figure 3 shows the main building of the Bureau of Science, much as it is today, where the medical staff worked, and many earnest hours of work were put in on health problems in that quarter of the old building.

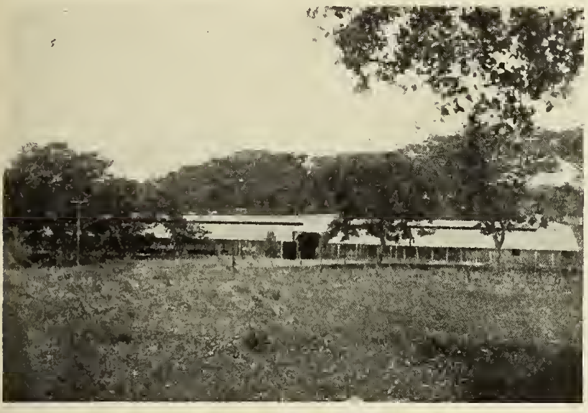


Fig. 4. The horse stables at Alabang.

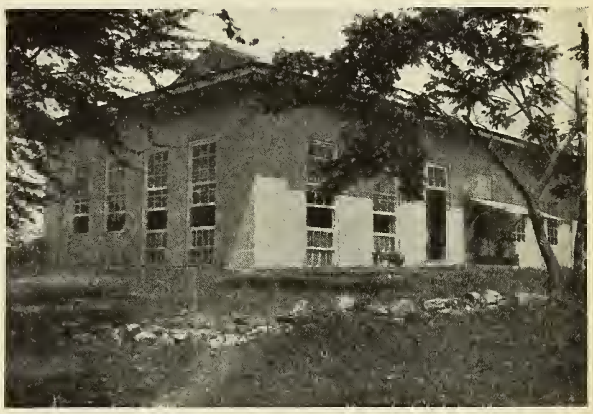


Fig. 5. The main laboratory building at Alabang.

Formerly, a large building at the back of this housed the experimental animals, from white mice and guinea pigs to horses and cattle, with an occasional python and cobra, but now there is a large plant at Alabang, a suburb of Manila, where much of the serum work is done. (Fig. 4.)

Dr. Victor G. Heiser, for many years Director of Health in the Philippine Islands, stated, in 1922, that before American occupation the annual death toll from smallpox in the provinces immediately around Manila alone was 40,000, and in Manila, 6,000. Now it is not uncommon to go a year without a smallpox death in Manila. The extreme heat makes the keeping of smallpox vaccine without ice a matter of but a few days or weeks at best. Therefore compulsory vaccination is difficult, except near Manila. About 1920 there was a campaign to abolish compulsory vaccination in the provinces on the ground of its being a failure, but investigation showed that the vaccine sent municipal officers was thrown unused into the waste basket, and more successful vaccinations were reported than there were people in the municipality. After this the Bureau of Health again sent its own men to do the vaccinating, and the death rate for smallpox again dropped; seven to twelve deaths per year being considered about normal for the provinces.

Although there is little diphtheria in the Philippines, an adequate supply of antitoxin is made by the Bureau of Science.

Other curative sera are made and kept for local needs, thousands of doses of Shiga dysentery serum being used each year.

No consideration of the medical situation would be complete without a word about leprosy, since about two out of each thousand are lepers.

Twenty to twenty-five years ago, at the beginning of effective segregation of lepers, 200 to 300 examinations were made annually by the Bureau of Science, but this work has been so increased that, in 1926, there were 6,394 in segregation. This of course does not include many of the very early cases, because leprosy is generally concealed as long as possible, though in late years more and more early cases apply for treatment.

Formerly leprosy was a hopeless disease, but in 1929, 553 cases were released on parole as arrested or cured, making a total released since 1922 of 2,013.

One-third of the appropriation for health service is allotted to segregation and treatment of leprosy. In addition there is the Leonard Wood Memorial, $342,500, allotted to three stations. John D. Rockefeller, Jr., has given $100,000 and the Eversley Childs gift is said to be the largest of all, but how large I have not been able to learn. The campaign began with a segregation station at Manila called San Lazaro, to be followed by the leper colony on the Island of Couillon, where 6,000 lepers are accommodated. Now the plan is to have stations in the various provinces much as we do our tuberculosis sanatoria. Figure 6 shows a plant for making ethyl ester of chaulmoogra oil, Manila.

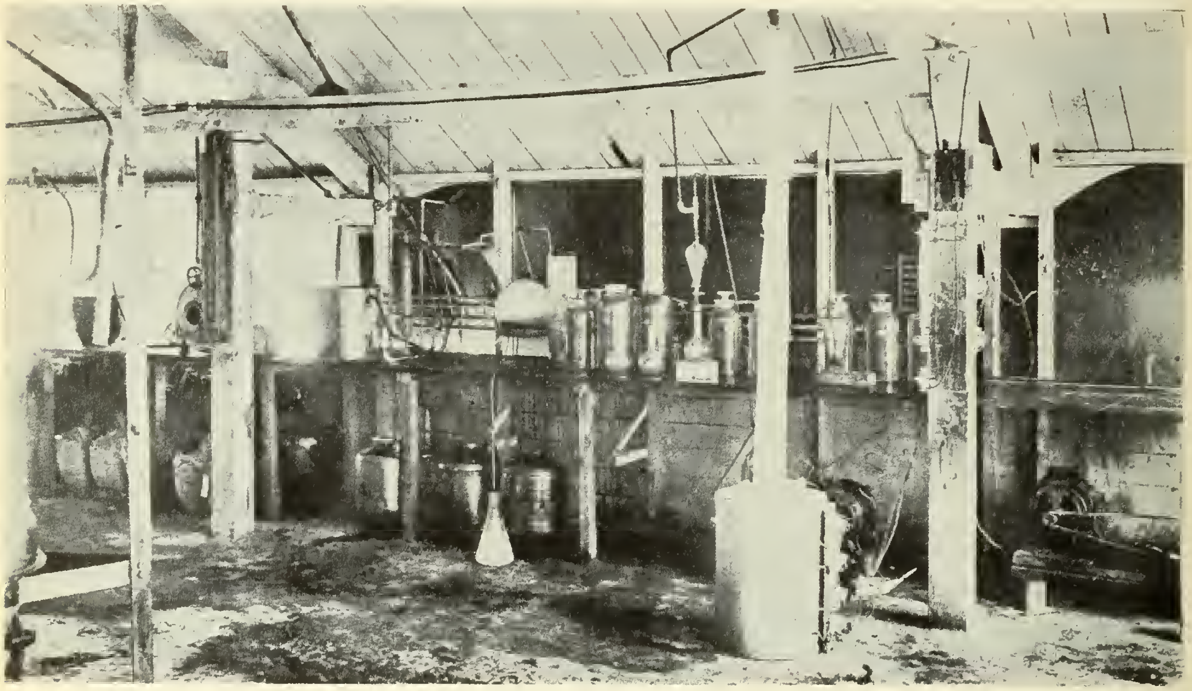


Fig. 6. Plant for making ethyl ester of chaulmoogra oil, Manila.

The arrested or cured lepers are becoming more and more of a problem in themselves, since the Filipinos are becoming leprosy-conscious, and most of the parolled cases return to Couillon, the leper colony, outcasts unable to return to their former places in society, or even to make a living away from the colony. So there is a need for the establishment of a colony for parolled cases. A certain number do relapse and must return to the treatment stations for more care.

Yaws, a disease somewhat resembling syphilis and like syphilis cured by intramuscular or intravenous arsenic, is fairly common.

Elephantiasis is hard to eradicate, because the filaria larva appears in the general circulation chiefly during the night, the regular feeding time of the carrier mosquito.

Madura foot, superficially resembling elephantiasis, but caused by a mycetozoa and akin to actinomycosis or lumpy jaw of cattle, is also hard to eradicate because of the barefoot habit of the common people.

For many years Santo Tomas University and Hospital had been graduating a few poorly trained men who practiced in and about Manila. Under American tutelage, laws have been passed making medical practice requirements of a very high order. In 1906 the medical department of the University of the Philippines was established, with men from the Bureau of Science and other men from the best American medical schools composing the faculty. Now both the faculty and the staff of the Bureau of Science are almost entirely Filipino, graduated from their own national school.

When America began the task of making Manila and the whole archipelago a more healthful place, military hospitals and military officers were utilized to enforce regulations. Later the Civil Hospital for government employees was established in a big rambling house, with two American physicians and a few American nurses in charge. Then the General Hospital was established under American management. Now there are over 90 registered hospitals in various parts of the archipelago with a capacity of over 8,000 beds.

We must not forget that, while this progress has been made, there are thousands of square miles where as yet no civilized man has set foot, with which no news is interchanged with the rest of the world.

A very marked improvement in health has been accomplished during the thirty years of American occupation, but any marked further advance must accompany improvement in economic conditions. There are now several thousand people for each registered physician, but any further supply must be native, for a foreigner will make more money elsewhere. It is almost axiomatic that a house visit should cost somewhere near the daily wage of a laborer. Twenty years ago the daily wage of a laborer in Manila was fifty cents or less, and native physicians were charging the price of two days' work or one dollar per visit, which naturally put the service of even the native physician out of the reach of the laborer. Present wages and fees I do not know, but I am sure that with the inadequate supply the laborer and others of the lower classes receive but little attention. A few American and other foreign physicians still remain to minister to the foreign population and the more well-to-do, but the majority of the natives must depend on the present inadequate supply, which, keeping pace with the advancement of the economic state, will possibly be adequate in another fifty years.

In 1906-1907 a special effort was made to improve the health of the prison population, isolating communicable diseases and, so far as possible, ridding all the inmates of parasites. At the beginning of the effort the city death rate and that of the prison was the same in spite of the crowded condition of the prison—forty-seven per thousand. After a year of effort the prison rate was cut to seventeen per thousand, showing some of the possibilities for improvement in tropical death rates.

At the time of American occupation, the infant death rate was 500 in Manila, where the people were most under the influence of western medicine, and the rate in the provinces was not known. Now, by education and sanitary laws the rate has been cut to 240. The rate is still too high but cannot be greatly improved till economic conditions permit better care of mothers and babies.

At first the general death rate was 150, rising in epidemic times even up to 300. After thirty years of education and effort it has been reduced to about twenty-seven, while at the same time the rate among the American residents is but nine. This comparison is not entirely accurate, for none in poor health is likely to seek residence in the tropics, and many who find themselves in serious ill-health return to America.

It will be seen that educationally as well as physically Manila is coming up out of the mud. With the accompanying improvement in the islands economically, hygienic conditions will also improve.

Acknowledgment is made to the Bureau of Science for the illustrations accompanying this article, which have been reproduced from various Bureau Reports.

CASE REPORTS

CARCINOMA OF THE PANCREAS WITH ESOPHAGEAL OBSTRUCTION FROM METASTASIS TO THE LYMPH NODES OF THE MEDIASTINUM*

REPORT OF CASE

Porter P. Vinson, M.D.
Division of Medicine, The Mayo Clinic,
and
James M. Marshall, M.D.
Fellow in Surgery, The Mayo Foundation,
Rochester, Minnesota

Obstruction to the passage of food through the esophagus is almost always the result of an intra-esophageal lesion. The elasticity and mobility of the esophagus is so great that lateral displacement of the organ does not interfere with swallowing and it is seldom that a tumor of any type will completely surround the tube and produce obstruction to the passage of food. The following case is presented because of the rarity of esophageal obstruction from extra-esophageal lesions.

REPORT OF CASE

A woman, aged fifty-nine years, was admitted to the clinic April 17, 1930. For six months prior to admission she had suffered from indefinite dyspepsia, with gas on the stomach, associated with much upper abdominal fullness. A dull, epigastric pain then gradually developed; it came on irregularly after eating, and lasted an hour or two, regardless of measures used for relief. In the four weeks immediately before the patient came to the clinic, she had had a constant feeling of nausea and epigastric fullness, but no vomiting. Weakness had been rapidly progressive and she had lost about 15 pounds in weight.

On examination, the patient was found to be very weak and undernourished. There was moderate rigidity of the muscles over the epigastrium, but a tumor could not be palpated. The concentration of hemoglobin was 62 per cent; erythrocytes numbered 4,400,000 and leukocytes 9,300 in each cubic millimeter of blood. The urine was normal. Analysis of gastric content revealed free hydrochloric acid to be 26 and total acidity 38. Material obtained by lavage of the stomach measured 350 c.c. and contained particles of food eaten the night before. Roentgenologic studies of the gastro-intestinal tract revealed obstruction of the duodenum about 10 cm. distal to the pylorus.

Abdominal exploration was performed by Judd, April 18, 1930. The pancreas was found to be very hard throughout. There seemed to be ulceration of the duodenum and proximal to this region of ulceration the duodenum was tremendously dilated. At operation, it could not be decided whether the condition was one of carcinoma of the pancreas or whether a large inflammatory duodenal ulcer, with secondary pancreatitis, was present. As the chief symptom to be relieved was the duodenal obstruction, posterior gastro-enterostomy was performed. There was no evidence of obstruction of the bile ducts.

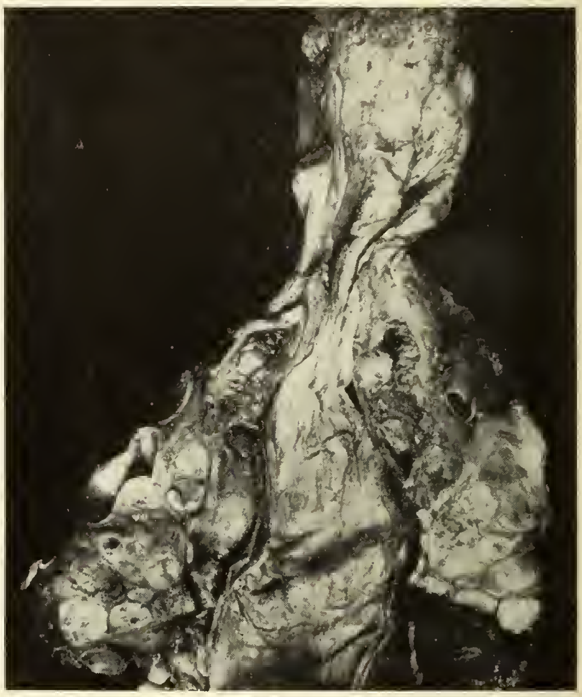


Fig. 1. Metastatic involvement of mediastinal lymph nodes, with consequent almost complete occlusion of the esophagus.

Convalescence was uneventful until about the seventeenth day after operation, when jaundice developed. The following day, the concentration of serum bilirubin was found to be 6.0 gm. in each 100 c.c. of blood and the van den Bergh reaction was direct. The jaundice progressed rapidly and obstruction to the flow of bile became complete. About this time, examination of material which drained from the duodenum failed to reveal bile. Operation was advised but the patient refused. Weakness progressed, the jaundice deepened, and finally, after twenty-seven days of complete biliary obstruction, she consented to another exploration.

June 2, 1930, Judd performed cholecystgastrostomy for obstructive jaundice due to obstruction of the common bile duct by tumor of the head of the pancreas. Immediately after the operation the jaundice became less marked, and by the tenth day had disappeared. However, the patient's strength gradually failed, and she died nineteen days after the second operation, from weakness and inanition. A week or more before her death she complained of difficulty in swallowing, and also of difficulty in vomiting. The general condition of the patient did not permit antemortem investigation of the esophagus.

---

*Submitted for publication August 1, 1930.

Necropsy revealed an extensive malignant growth of the pancreas, with extension to the wall of the duodenum, producing duodenal obstruction, and also occluding the lower end of the common bile duct. There was extensive metastasis to the mediastinal lymph nodes, two of which almost completely occluded the esophagus (Fig. 1). There was extensive metastasis to both lungs.

IMPALEMENT OF THE RECTUM

REPORT OF CASE

Harold E. Hullsiek, M.D., F.A.C.S.*
Saint Paul

Impalement wounds of the rectum are among the most serious of the accidents of civil life. They are most frequently met with in agricultural districts, where they occur usually as a result of individuals sliding or jumping from hay-mows or wagons and becoming impaled upon pitch-forks, hoes, or similar implements. Males make up the majority of the victims. In Heath's series of eighty-three cases, seventy were males. In forty-six instances the smooth handles of pitchforks, hoes, brooms, etc., were responsible for one-half.

Anatomic configuration influences the course of the foreign body, and the weight of the person together with the height from which he falls are also important factors. The converging aspect of the buttocks deflects the impaling object toward the ischio-rectal space, while the bony framework guides it thereafter. The object may pass through the anal orifice without injury to it, it may perforate the perineum, or it may penetrate the tissues lateral to the anus. Once inside, it is not uncommon for it to become impacted against the sacrum, either the sacral promontory or the foramina, or it may travel on upward. The rectum is the most frequently involved organ, and next in order is an accompanying wound of the bladder. Septic peritonitis resulting from perforation of the abdominal cavity is a frequent and to-be-dreaded complication.

It is remarkable to note what appalling injuries of this type may occur and still be followed by recovery. Woodbury reports the case of a girl of eighteen years of age, who fell eight feet onto a stake three inches in diameter, which passed twenty-seven inches and emerged at the left side of the breast, fracturing three ribs on the way. The girl was back in school in six weeks. It is interesting to speculate as to the course of the perforating body in this case.

On the other hand Heath's patient fell only four inches onto the handle of a hammer and died in a few hours. At autopsy a fragment of trousers was found in the abdominal cavity together with small masses of feces.

In Van Hook's series the mortality was 35.5 per cent, but of the thirty cases having extra-peritoneal injuries only, all recovered. Those having peritoneal involvement had a mortality of 71.4 per cent.

Careful cleansing, removal of any foreign material, together with provision for drainage constitutes the treatment in those cases where one can be reasonably certain that there has been no injury to the peritoneum. In those in which such an injury has occurred, immediate laparotomy is essential.

The case I wish to report is that of a young man of thirty years, employed by a packing company. He was first seen on May 30, 1930, with a history of having two weeks previously slipped and fallen over backwards onto an iron rod which extended upward from a small platform on the floor. The impaling object was apparently about one-half or three-quarters of an inch in diameter. At the time he felt an intense pain about the anus but could discover no wound. After resting for an hour or two he returned to his work. The day following he was fairly comfortable and continued to work. Four days later he again began to have pain about the rectum, and six days after the accident something "broke" and discharged near the anal opening, with a relief of the pain.

Examination showed the opening of a sinus in the skin three-quarters of an inch from the anus in the mid-line posteriorly. A probe passed into the tract proved it to extend for one and a half inches towards the coccyx and slightly to the left. No connection with the rectum could be determined either by means of the probe or by a roentgenogram of the barium-filled tract.

The question at issue was whether the accident bore any relation to the existing sinus, and was a matter of liability. It was felt that this could not be definitely settled, but in any event the treatment of the sinus was surgical.

At operation the tract was carefully explored under sacral anesthesia. As the probe had indicated, it extended upward for about an inch and a half to a point anterior to the sacro-coccygeal joint. At the bottom of the tract a small fragment of cloth was discovered. This measured one-half an inch in diameter, and was of khaki material. No connection with the rectum could be found. The tract was laid open and packed, after which prompt and uneventful healing took place.

Reconstructing the injury and its complications was not difficult in the light of the operative findings. The rod had apparently passed through the anal orifice, with no injury to it, and had then passed upward, perforating the wall of the rectum and coming to rest against the sacrum. As it forced its way through, it carried with a fragment of the man's trousers, which was in all likelihood punched out by the action of the end of the rod against the sacrum. When the rod was withdrawn, the small piece of cloth was left remaining in the wound. The wound in the rectal wall had apparently healed quite promptly, leaving a closed space in which the foreign body lay. After an interval of three or four days sufficient suppuration occurred to cause a rupture of the abscess and a discharge of pus to the outside. The discovery of the cloth in the sinus naturally proved conclusively the relation of the sinus to the original impalement.

---

*From the Miller Clinic.

Hamm Building.

FREE JOINT BODIES

REPORT OF TWO UNUSUAL CASES

Wallace H. Cole, M.D.
Saint Paul

One hesitates to add to the already voluminous literature on free joint bodies but the two cases to be reported seem to be so unusual that some available record should be made of them.

The first patient was a middle aged farmer who was seen the day after he had been injured in an automobile accident out in the country. He received first aid for a large laceration over his left eye and for an injury to his right elbow, the elbow being placed in a right-angle splint. This splint was still in place when the patient was first examined in the office. There was no history of any previous disability to the elbow joint, although the patient could remember several times when he had received severe contusions without any disability following. Without removing the splint a radiograph was taken which showed a transverse fracture of the olecranon with what was apparently a foreign body lying between the fragments, but after removal of the splint examination showed no break in the skin of the elbow and a new film demonstrated a free body (Fig. 1). Operation was performed that afternoon and a typical "joint mouse" was found lying between the fragments as shown in the radiograph. The free body was flattened and disc-shaped, measuring about 1.3 centimeters by .6 of a centimeter (Fig. 2). Its surface was slightly lobulated and smooth in the way characteristic of free bodies which have been in joints for some time but there was a small tag of soft tissue attached near one end. Upon cutting the body in two it was found to be very hard but not bony in density. The cut surface seemed to be calcareous and was definitely laminated but no area of true bone was observed (Fig. 3). The tissue was very easily decalcified and microscopic sections showed a cartilaginous mass with areas of calcification. The cartilage was alive and apparently growing (Fig. 4). Recovery from the fracture was uneventful.

Free bodies in the elbow are not uncommon, that joint coming next to the knee in the frequency of this lesion, but on account of its structure the symptom of "catching" or "locking" seen so typically in the knee is frequently lacking. A body can, therefore, be present in an elbow for many years without causing symptoms. The origin of the body under discussion is problematical but the lack of bone seems to rule out the so-called osteochondritis dissecans. Probably either a small flake of articular cartilage had been separated off in the past and had become attached to the synovial membrane near the olecranon fossa, or the fragment started as a small cartilaginous growth from the synovial membrane itself. This had gradually enlarged, receiving its nourishment by means of its attachment as well as from the synovial fluid. At what time the body became free is, of course, problematical but the ragged tag on the "mouse" might indicate that it had been torn loose from its synovial attachment only at the time of the accident. Being free and lying posteriorly in the joint it naturally fell between the fragments of the fracture.

The second patient was a man sixty years of age who, for about two years, had had some indefinite trouble with the right knee which was never severe enough to keep him from work. About a month before he was seen he had a sudden attack of pain in the knee which had caused definite disability since. There was no locking at any time, however, but pain was always present on use of the leg, being centered about the mesial side of the joint. This pain was always relieved by rest.

Examination showed a man with rather marked bow

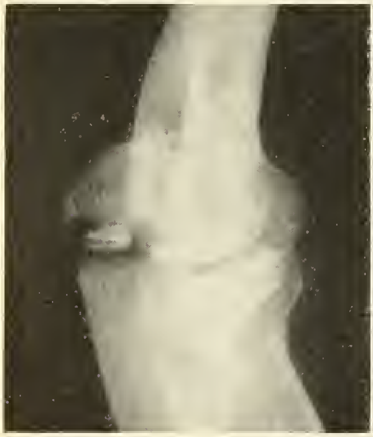


Fig. 1. Lateral radiograph of elbow showing fracture of olecranon process with a free body lying between fragments.

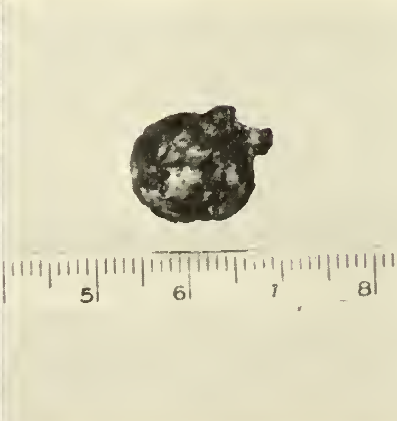


Fig. 2. "Joint mouse" removed from between fragments of fractured olecranon.

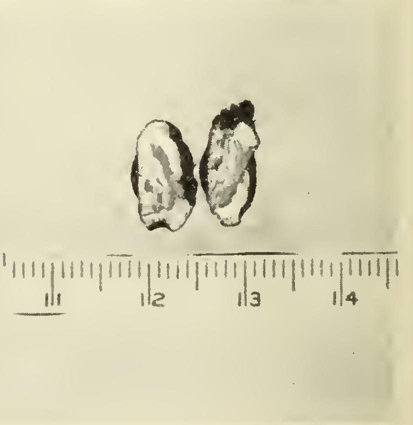


Fig. 3. "Joint mouse" shown in Figures 1 and 2 cut across to show gross appearance. Note laminated structure.

legs but with no definite findings in the knee joints. The region of the mesial collateral ligament of the right knee was indicated as the area where discomfort was felt but no tenderness was present here, although pain was referred to that point on forcing hyperextension of the joint and attempting to increase the varus. Radiograph disclosed a shadow of a free body lying anteriorly and slightly laterally in this joint (Figs. 5 and 6). Although the symptoms had not been in any way typical or even suggestive of a free body it was felt that its presence was the underlying factor in the disability and that there was no question but that it should be removed. On account of its position as shown in the radiograph, that is, very close to the tibia and anteriorly in the joint, a diagnosis of free body under the lateral semilunar cartilage was made, as this condition had recently been reported. At operation the lateral cartilage was exposed and, although a hook was passed beneath its free margin, the body could not be located. Feeling sure of the diagnosis, however, the cartilage was freed from its attachment to the tibia for about 1.5 centimeter, and on lifting it up the body was seen lying loose beneath it.

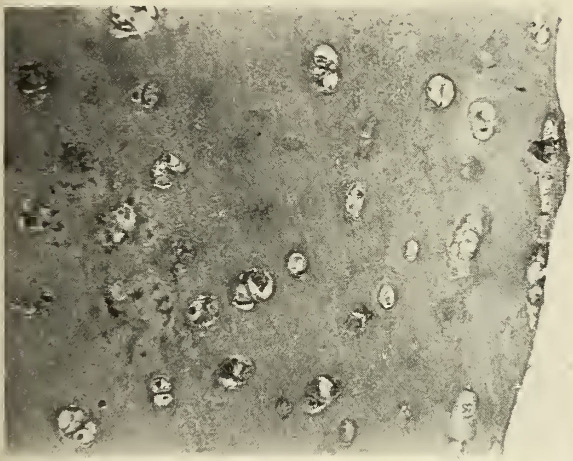


Fig. 4. Photomicrograph of free joint body shown in Figures 1 to 3 showing growing cartilage and areas of calcification.

No source of the body was found at operation, all joint surfaces seen being smooth and normal in appearance. The fragment (Fig. 7) was a typical flattened joint body measuring about 1.4 centimeter by 1.1 centimeter and on section showed no lamination but a bony center with proliferation of cartilage around it (Fig. 8).

Geist has reported two cases of free bodies beneath the lateral cartilage and if it had not been for the knowledge of these the search for such a body as now reported might have been unsuccessful. Although the condition is undoubtedly rare many minutes of anxious searching may be saved if its possibiilty is kept in mind. The origin of the free body in question is problematical as no source was found, but the bone in the center shows the origin might have been from some small fragment broken or separated off in the past from one of the articular surfaces. During the two years of indefinite discomfort in the knee, the body having lodged beneath the lateral meniscus was gradually growing until finally it reached such a size that by some movement or change in position it caused a catch without locking, and a definite disability on weight bearing.

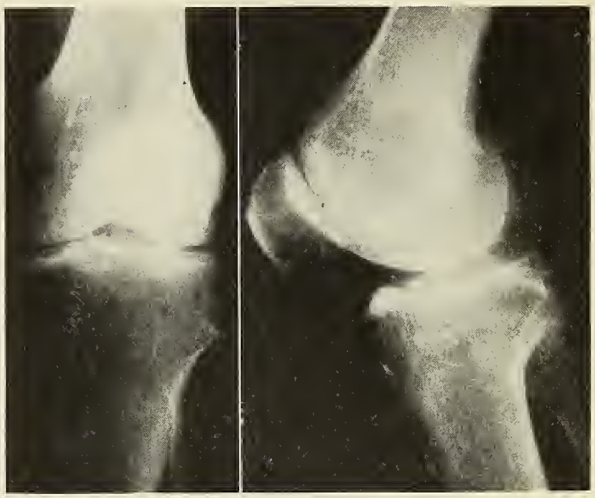


Fig. 5 (Left). Antero-posterior radiograph of knee showing free body lying close to tibia in lateral side of joint. This body is beneath the lateral meniscus.

Fig. 6 (Right). Lateral radiograph of knee shown in Figure 5.

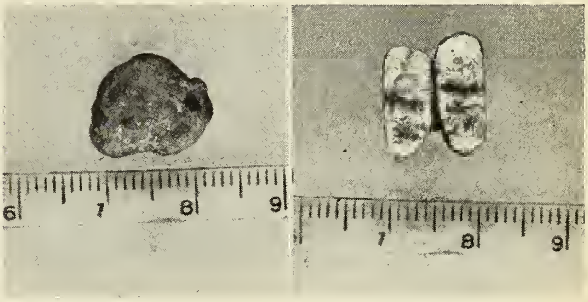


Fig. 7 (Left). Free joint body removed from beneath the lateral meniscus of the knee.

Fig. 8 (Right). Section of body shown in Figure 7, showing thickness and structure.

PRESIDENT'S LETTER

ONE day last month St. Paul and Minneapolis physicians were invited by the Community Chest organizations of the two cities to listen to luncheon speeches on the subject of the Cost of Medical Care.

The speakers in each case were lay public health workers in the employ of the Committee on the Cost of Medical Care. Their remarks were confined to already published studies of the committee.

But it occurred to me to wonder just how it has come about that lay social groups are inviting the medical profession to listen to figures on the cost of medical care.

Why wasn't it the county medical society or the state association that was sponsoring these public luncheons on the subjects relating to medical care?

How did this busy and diversified Community Chest group come to be sufficiently interested in the subject to bring in a speaker at their own expense to tell us about it?

There is unusual interest in medical matters everywhere these days. Pick up any of the first class magazines and you will find at least one, and maybe more articles about the medical profession or about medical costs and the distribution of medical care.

This is obviously the doctor's problem as much as it is anybody's. The doctor has something of value to offer to any discussion of the subject because he alone is dealing intimately with both patients and doctors. But curiously enough these exhaustive medical articles are seldom written by medical men.

The inequality in distribution of medical care is bound up, to a considerable extent, with an economic situation that is beyond the immediate adjustment of either doctor or social worker. But certainly it is the physician's business to be as well informed and as actively interested as the social worker in economic readjustments of the care of the sick. County medical societies ought to be at work on it. Auxiliaries ought to be interested, medical journals ought to be studying it. Physicians ought to be at least as well qualified and as ready to talk about the situation as lay observers.

The fact is that we have now in America a new professional group. The social worker group with its specialized training and its diversified interests that are as wide as all society. These new professional men and women are professionally interested in poverty and sickness. It is only another step—and a step which they make with enthusiasm—to interesting themselves in the medical profession and its problems.

The Committee on the Cost of Medical Care is one practical result of this intelligent, active interest. American Medical Association representatives are participating to some extent in the studies made by the committee. Unfortunately they did not initiate it nor were they party to its organization. The committee has been making exhaustive studies into its subject, supported by lay foundation funds. It will be ready in another year to draw conclusions from the mass of data and to make recommendations. What those recommendations will be, physicians can only guess.

Is the medical profession informing itself, also?

Will it be ready as an interested party to accept or reject these recommendations intelligently?

In this letter I want to urge every county medical society in Minnesota to make a serious, unprejudiced study of the problem of the costs of medical care—if it is a problem—and do it NOW.

The problem of distribution of medical care and costs, which includes, of course, hospital care, nursing, drugs as well as doctors' fees, is one of our problems—the problem of the Minnesota State Medical Association and each of its component societies and its auxiliary organizations, quite as much as of any social service group, however active or inclusive its interest.

It would be a pity, indeed, if the great profession of medicine were ever to be caught in the unfortunate position of giving a reluctant, forced submission to outside reorganization of its own domain—all because it was too short sighted or too busy, or too indifferent to inform itself in time.

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE
Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE
A. S. HAMILTON, M.D.....Minneapolis
D. C. BALFOUR, M.D.....Rochester
J. T. CHRISTISON, M.D.....St. Paul
E. L. GARDNER, M.D.....Minneapolis
JOHN M. ARMSTRONG, M.D.....St. Paul
R. E. FARR, M.D.....Minneapolis

CARL B. DRAKE, M.D., St. Paul.....Editor
Lewis M. Daniel, M.D., Minneapolis.....Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna.....First District
F. M. Manson, M.D., Worthington.....Second District
Geo. B. Weiser, M.D., New Ulm.....Third District
H. B. Aitkens, M.D., LeSueur Center.....Fourth District
F. U. Davis, M.D., Faribault.....Fifth District
E. L. Gardner, M.D., Minneapolis.....Sixth District
Paul Kenyon, M.D., Wadena.....Seventh District
O. E. Locken, M.D., Crookston.....Eighth District
E. L. Tuohy, M.D., Duluth.....Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV April, 1931 No. 4

THE STATE MEETING

An afternoon of clinics, led by the best medical talent available in the University of Minnesota medical teaching staff and elsewhere, is announced as the major feature of the seventy-eighth annual meeting of the Minnesota State Medical Association, to be held in Minneapolis, Minnesota, with headquarters at the Nicollet Hotel, on May 5 and 6, 1931.

This interesting departure from ordinary program composition is to occupy the entire Tuesday afternoon session of the meeting. A total of thirty-two clinics will be held in four amphitheaters of the University Hospital and Medical School, which are to be turned over to the State meeting for the occasion.

The remainder of the two-day scientific program will be divided into three main divisions, all to take place at the Nicollet Hotel.

Surgery and obstetrics will occupy the Tuesday morning session. Wednesday morning will be devoted to a Symposium on Diagnosis, and Wednesday afternoon to a Symposium on Therapy similar to the successful symposium that concluded the Duluth program last year.

Among the distinguished visitors who will be present for the meeting are: Dr. George Ward Gray, Jr., Professor of Obstetrics and Gynecology at Cornell University, New York, who will speak as George Chase Christian Memorial lecturer on "Carcinoma of the Uterus" Tuesday morning, and Dr. Drew William Luten, Assistant Professor of Clinical Medicine at Washington University, St. Louis, Mo., who will talk Wednesday morning on "Diseases of the Heart with Special Reference to the General Practitioner."

An important series of clinical demonstrations and exhibits, all of them intimately related to the scientific program, will be on view at the hotel. Among these will be the University of Minnesota, the Mayo Clinic and the State Department of Health exhibits, a tuberculosis demonstration and the display of Brush bacteriological specimens.

The Southern Minnesota Medical Society will again present a gold medal for the best individual contribution to these exhibits, following a precedent set last year.

The Women's Auxiliary of the Minnesota State Medical Association, which holds its annual meeting at the same time, will join with the Medical Association for the annual banquet of the two organizations to be held at the Nicollet Hotel on Tuesday night.

The House of Delegates will meet on Monday night, May 4, at 7:00 P. M. at the Nicollet Hotel. The following are members of the Reference Committee: Dr. J. R. Manley, Duluth; Dr. W. C. Carroll, St. Paul; Dr. H. M. Blegen, Warren;

Dr. C. P. Robbins, Winona; Dr. C. B. Wright, Minneapolis.

The scientific program of the seventy-eighth annual meeting appears in this issue of the Journal. Members are urged to make their plans at an early date so as to be able to attend this meeting.

THE TUBERCULOSIS CAMPAIGN

The annual Early Diagnosis of Tuberculosis campaign, conducted by the Minnesota Public Health Association and its affiliated national body, the National Tuberculosis Association, will focus its attention particularly this year on the period of adolescence.

Special studies made generally over the United States indicate that an alarmingly high percentage of children of the 'teen ages, compared with other age groups, are breaking down with tuberculosis. That this is the weak spot in our defense armor against tuberculosis has long been obvious to the doctor. Any authoritative public education campaign which calls emphatic attention to the dangers surrounding this age and the absolute necessity for early discovery of possible tuberculosis infection has the doctor's sympathy and coöperation.

Tuberculosis in early adulthood undoubtedly has its usual origin in a childhood infection with the disease and too often in an unsuspected long continued contact with open tuberculosis. Early detection of this infection and protection against such contacts, so far as widespread public education can bring about these highly desirable results, are the objectives of this campaign. It has the hearty endorsement of the Minnesota State Medical Association and will, incidentally, enlist the services as speakers of many association members in the course of the campaign.

DR. BIRNBERG'S MOVIE FILMS OF RUSSIA AND HIS COMMENTS*

Strange reports and conflicting conclusions have come from post-war Russian visitors. Most of us have heard lectures by educators, ministers or writers, portraying their travel stories and impressions. It is a pleasure to accord to one of our own members credit for his incomparable industry—in three weeks he covered the area from the Baltic to the Black Sea. For an amateur photographer he showed unusual adeptness—he brought back views of everything from "droschkes" to churches, temples, marriage ceremonies and nude bathing! What his discerning medical eyes singled out his camera brings to his spoken words the most convincing confirmation. When he remarks that the people evidence no unusual undernutrition but plenty of evidence of primitive dress and living he can prove it with his engaging films. He shows the actual cues of people waiting in line with their food cards, which we have heard so much about. At a time of unusual unemployment with us, when various methods are being devised to enable people to eat, it is interesting to note that in Russia the only way one can get a food card is to be gainfully employed or too sick or too old to work! Indeed, everybody works, "including father." Men and women work together, whether it be in digging sewers or in staffing hospitals, with no distinction whatever as to pay but considerable as to diet, since those doing the heavier, manual type of work are given the more invigorating rations. He carefully points out that these restrictions are not on a basis of "class," but according to category—A, B and C—and the doctors, on a basis of mental work, are in Class "C"! In a country which has set itself to abolish all notions of class distinction, he comments that the dining car service he saw on the way to the Crimea defied description, that the cars were divided into the types "hard" and "soft"!

Russia, so violently disturbed, offers a most unusual array of paradoxes; with all their turmoil they are by far the most hopeful present-day Occidental nation. They have so much individual autonomy and yet such extremes of police interference; "a people who use us (perhaps the most capitalistic of all countries) as their example, though they aim by the most violent and extensive of propaganda to destroy the world's principle of individual ownership and to establish Communism."

Dr. Birnberg has brought us some intimate glimpses of the changes that have befallen our medical brethren in Russia. A high grade of medical training and system of apprenticeship has been worked out, all at public expense. A most unusual redistribution of doctors has been worked out, and the younger men are sent to the rural districts. Those who succeed or show research capacity are singled out and helped. The inference is given that those particularly gifted may choose their own types of work and places of abode. With the criticism that is leveled more or less persistently at our general plans and methods of developing specialism, it is interesting that they insist upon three full years of preparation and "a period of four months spent in special research and study every third year." Very large groups of individuals, as well as diseases, may be studied, not only from the disease standpoint but from the economic and social side as well. Their attitude toward the problem of prostitution—with an effort at social and economic adjustment rather than reform—is strikingly suggestive. Apparently Russian medicine has already greatly influenced much of continental Europe. "The whole situation is the most amazing human experiment ever contemplated." Thus, we can see that no matter what happens to Russia in the future the world is never going to be quite the same because of what has already occurred.

---

*A recent address by Dr. Tobias L. Birnberg, St. Paul, with personally taken movie films on the occasion of a visit into Russia in the summer of 1930, and given in the University Extension Course for doctors at Duluth, Feb. 23, 1931.

This whole wretched problem is so engaging, so much mooted, and so unutterably complex, that we should all be most thankful to Dr. Birnberg for his zeal in accumulating his evidence, and his gifted and spirited, as well as unbiased, attitude, in relating his impressions. The address should be heard by all our doctors as well as their families and friends. The suggestion might be passed to the program committee of our State society, so that at our next meeting the data here most inadequately touched upon might be given, provided the good Doctor will consent to do so.

E. L. T.

TOBACCO

On the basis of one national principle that if there is something people like to do there must be some reason why they should not do it, scientific investigators might be expected to have found some reason unqualifiedly to condemn the use of tobacco. On the basis of another national principle that anything advertised with enough millions must be of virtue, it might be expected that these same investigators would have found that abstinence from tobacco is the hidden cause of lack of charm or of virility. But scientific investigators are free of fixed ideas, as long as they remain scientific.

The day may come when it will be a mark of individuality to amble a nonchalant mile for one of a coughless consignment of cigarettes and then secretly to toast it over one's bootleg fire, but that day is not yet. Nor has the time come to educate the young mother that an infusion of tobacco must be mixed with the baby's food for the vitamins therein contained. Consequently, the perennial question of the harmfulness of nicotine, "pyridine and other pyrogenous compounds, carbon monoxide, traces of hydrocyanic acid, phenols and aldehydes" continues to bloom with the violets, and in between. And it should, for the problem needs solution.

The effects, not of nicotine only, but of the several chemical substances just mentioned, alone or together, must be considered when tobacco is smoked. Also, where it is grown, how it is cured, whether it is moist or dry, how fast it is smoked, how slowly, how it is wrapped, or what kind of a pipe is used, enter into the question. Moreover, the smoke may be inhaled or puffed, and tobacco may not be smoked at all. Tobacco may be, at least it used to be, chewed, whether or not circumstances would allow of expectoration. Doubtless all physicians can remember certain hirsute males who boasted that they ate theirs. As the biometrician might say, several variables seem to be involved.

Since these variables are not likely to be brought into correlation by the advertising writers and the physicians who help them with their copy, let us see what opinions a few of the serious seekers have evolved. In 1927 a small volume, written by Schrumpf-Pierron was published under the auspices of the Committee to Study the Tobacco Problem. The bibliography contained 750 names, more or less. Schrumpf-Pierron's conclusions were, in part, as follows: The study of the action of tobacco on the organism is still incomplete, both scientifically and clinically; sound individuals and unsound individuals react differently; immoderate doses cause disturbances that are first functional, then organic, and some of them are grave; disturbances have increased in frequency as the consumption of tobacco, particularly of cigarettes, has increased; the cigarette habit leads readily to abuse; further studies are needed, particularly "statistical research as to the influence of tobacco as ordinarily used among large groups of people as compared to the effect of abstinence among similar groups."

That does not give much of a chance for either the reformers or the copy writers to attack the subject from the health angle. The investigation, however, is being carried on.

W. E. Dixon, pharmacologist at Cambridge University, has studied the subject of the tobacco habit. He concluded his Norman Kerr lecture with the statement that smoking "leads to digestive and circulatory disturbances." He gave expression to an impression of clinicians that many years of continuous absorption of nicotine is responsible for some cardio-vascular conditions of middle life and old age. However, he continued, "It may well be that living in a civilization such as ours, under the conditions of strain imposed by residence in cities, the ordinary man shows in his nervous responses variations from the normal, and on such tobacco exerts a beneficial function."

Rolleston has in a sense carried on the work of Schrumpf-Pierron by collecting from the literature the views of thirty-four writers on the effects of tobacco. He did not come to conclusions. Who could?

It is not easy to see how a study could be prosecuted more scientifically than that of Diehl, of the University of Minnesota. He had a group of 445 smokers and one of 441 non-smokers. The work was analyzed by biometric methods. However, as Diehl pointed out, the subjects were too young to have suffered from degenerative changes, if tobacco is responsible for any. He found that the smokers had less stable cardio-vascular systems than non-smokers. However, he was careful to state that "the effect of such a difference on health or longevity never has been determined." The final rating of the two groups for classification for physical activities were not significantly different.

Another relevant piece of work done in Minnesota is concerned with the old question of tobacco and thrombo-angiitis obliterans. Barker studied the consumption of tobacco by 350 patients between the ages of twenty-five and fifty-five years, who had thrombo-angiitis obliterans and who had been seen in The Mayo Clinic in the last ten years. He compared with this group another that corresponded with the first in every way except that the members of it did not give evidence of peripheral vascular disease. He found reason to believe that tobacco is not the primary cause of thrombo-angiitis obliterans, but that it may be a predisposing cause. Moreover, if patients with thrombo-angiitis obliterans have used tobacco excessively, the condition seems likely to run a more malignant course. Barker expressed the belief that evidence favors prohibition of the use of tobacco to patients with thrombo-angiitis obliterans, but, he added, "the data are by no means conclusive."

W. J. Mayo, who never has used tobacco, in discussing Barker's report, gave the present status of the tobacco problem as well as it can be stated: "I have no evidence to show that a moderate use of tobacco is harmful to the average person, but we know that even what might be called moderate smoking is harmful to some persons. On the whole, smoking seems a habit which has possibilities for harm, and has little to its credit, although many seem to derive a good deal of comfort from it, especially those persons who have nothing to do at the time which interests them more. Pipe smoking should be the least harmful, because the pipe is usually out, and the smoker is just as happy until he notices the fact, which depends largely on how much interested he is in what he is doing. The pipe seems to be the adult pacifier which takes the smoker back to his childhood days.

"Some smokers, especially of strong cigars, have functional heart trouble, and it now appears that the cigarette smoker is subject to various ills. I doubt that much harm results to the person who smokes a cigarette only occasionally."

From all that has been done thus far, it seems that "T. M." means both "'tis mince" and "'tain't mince." The Governor of North Carolina and the Governor of South Carolina each must have been an excellent judge of good liquor. One said there was iron in the whisky; the other said, leather. When the barrel had been drained, they found in the bottom a loose tack, just under the head of which was a leather gasket. Yet it is not recorded that either governor died of hepatic cirrhosis. Nor is the opposite on record, for the story is fictitious.

We need the facts about cirrhosis. We also need them about the effect of tobacco. All encouragement to those who are seeking them, and caution to those who are inclined to jump to conclusions.

R. M. Hewitt, M.D.

BIBLIOGRAPHY

1. Barker, N. W.: The tobacco factor in thrombo-

angiitis obliterans. Proc. Staff Meetings of Mayo Clinic, 6:65-67 (Feb. 4), 1931.
2. Diehl, H. S.: The physique of smokers as compared to non-smokers. Minnesota Med., 12:424-427 (July), 1929.
3. Dixon, W. E.: The tobacco habit. Brit. Med. Jour., 2:719-725 (Oct. 22), 1927.
4. Mayo, W. J.: Discussion. Proc. Staff Meetings of Mayo Clinic, 6:67-68 (Feb. 4), 1931.
5. Rolleston, J. D.: The tobacco problem: a review of recent literature. Bull. Hyg., 5:183-189 (March), 1930.
6. Schrumpf-Pierron, Pierre: Tobacco and physical efficiency. New York, P. B. Hoeber, Inc., 1927, 134 pp.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

Abbott Laboratories
- Ampules old Sodium Thiosulphate-Abbott, 0.01 Gm.

Arlington Chemical Co.
- Grass Mixture No. 1 Pollen Extract-Arlco (Timothy, June Grass, Orchard Grass, Red Top, in equal parts); Grass Mixture No. 2 Pollen Extract-Arlco (Timothy 40 per cent, Orchard Grass, Red Top, and Sweet Vernal Grass, each 15 per cent); Grass Mixture No. 3 Pollen Extract-Arlco (Bermuda Grass and Johnson Grass in equal parts); Ragweed Dwarf and Giant Mixture Pollen Extract-Arlco (equal parts of each); Birch Mixture Pollen Extract-Arlco (White Birch, Black Birch, Yellow Birch in equal parts); Maple Mixture Pollen Extract-Arlco (Red Maple, Ash-leaved Maple, Norway Maple, Sugar Maple in equal parts); Oak Mixture Pollen Extract-Arlco (White Oak, Red Oak, Black Oak, Swamp Oak in equal parts)

Fairchild Bros. & Foster
- Liver Extract-Fairchild

Eli Lilly & Co.
- Tablets Amytal, ¾ grain

H. A. Metz Laboratories
- Sulpharsphenamine-Metz, 0.75 Gm. Ampules
- Sulpharsphenamine-Metz, 0.9 Gm. Ampules
- Sulpharsphenamine-Metz, 3.0 Gm. Ampules

G. D. Searle & Co.
- Procaine Borate-Searle
- Ampules Procaine Borate and Epinephrin 1 c.c.

Health Products Corporation
- Marine Liver Extract (White)

Schering Corporation
- Iopax

The following articles have been exempted and included with the List of Exempted Medicinal Articles (New and Non-official Remedies, 1930, p. 477):

Chas. Pfizer & Co.
- Cinchophen-Pfizer

G. D. Searle & Co.
- Ampules Sodium Thiosulphate (Searle) 5 c.c. +
- Ampules Sodium Thiosulphate (Searle) 10 c.c. +

TRUTH ABOUT MEDICINES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

Procaine Borate.—A borate formed by the interaction of *p*-aminobenzoyl-diethylaminoethanol (procaine base) and boric acid. It contains 58.1 per cent of *p*-aminobenzoyl-diethylaminoethanol. Procaine borate closely resembles procaine hydrochloride in its actions and uses. When injected subcutaneously, procaine borate exerts a prompt and powerful anesthetic action. It is non-irritant. Its action is enhanced by the addition of a small amount of epinephrine, as in the case of procaine hydrochloride.

Procaine Borate-Searle.—A brand of procaine borate-N.N.R. It is also supplied in the form of ampules procaine borate and epinephrine 1 c.c., containing procaine borate-Searle 0.0216 Gm. and epinephrine 0.00017 Gm. in 1 c.c. G. D. Searle & Co., Chicago.

Liver Extract-Fairchild.—A complete concentrate of an aqueous extraction of fresh edible liver, freed of connective tissue, lipoid, and heat-coagulable protein. It is marketed in vials, each containing the material derived from 100 Gm. of fresh liver. Liver extract-Fairchild is used in the treatment of pernicious anemia. Fairchild Bros. & Foster, New York. (Jour. A. M. A., February 14, 1931, p. 529.)

Marine Liver Extract-White.—A liver extract representing the water-solutble fraction obtained from the livers of fish of the Gadus family in a glycerol-water solution. 100 c.c. represents fresh liver, 3,027 Gm. (1 fluidounce represents 2 pounds avoirdupois). Controlled clinical observations show that in pernicious anemia rapid improvement may be expected following the administration of marine liver extract-White. Health Products Corporation, Newark, N. J.

Pollen Extracts-Arlco.—The following pollen extracts-Arlco (New and Non-official Remedies, 1930, p. 29) have been accepted: Grass Mixture No. 1 Pollen Extract-Arlco; Grass Mixture No. 2 Pollen Extract-Arlco; Grass Mixture No. 3 Pollen Extract-Arlco; Ragweed Dwarf and Giant Mixture Pollen Extract-Arlco; Ragweed Mixture Plus Burweed Marsh Elder Pollen Extract-Arlco; Spiny Amaranth Pollen Extract-Arlco; Western Water Hemp Pollen Extract-Arlco. Arlington Chemical Co., Yonkers, N. Y. (Jour. A. M. A., February 21, 1931, p. 613.)

ACCEPTED DEVICES FOR PHYSICAL THERAPY

The following has been accepted by the Council on Physical Therapy of the American Medical Association for inclusion in its list of Accepted Devices for Physical Therapy:

National Vaporizer.—This apparatus is designed for the purpose of vaporizing oil or aqueous solutions and atomizing very fine impalpable powders. The apparatus contains no metal valves or parts that may oxidize or stick together. It is so constructed that it enables almost the entire solution to be vaporized. The apparatus is relatively fragile. National Drug Co., Philadelphia. (Jour. A. M. A., January 24, 1931, p. 271.)

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

Advertising and the Doctor

"Although the great American god 'Advertisia' apparently controls most of our activities and our interests, it has not thus far succeeded in gaining a complete overlordship in the field of medicine. True, the use of the health claim for the advertising of antiseptics, tooth pastes, foods and most household utilities has become a popular means of approach to the 'health-conscious' public. True, some clinics still promote their services to the indigent and the middle class by extensive announcements in the public press; for this, however, the plea of holy charity is used in extenuation. Again and again, advertising agents seeking some new outlet for the practice of their art have developed campaigns to be financed by medical societies or by individual physicians with a view to placing the wares of the medical profession before the public, as the services of musicians, plumbers, electricians and bakers are advertised. Thus far few medical societies of importance have succumbed to the lure of such promotions.

"Medical education of the public is just as much a function of the press as education in the rules of contract bridge, the technic of golf or the proper training of children. The threat of any newspaper that it will omit scientific news of importance in the field of medicine unless physicians purchase advertising space is an idle threat. Any newspaper worthy of the name must publish scientific news. The vast majority of competent editors are convinced that few other news items are of equal significance at the present day. The newspaper that is dominated in its news columns by its advertising department is on the road to ruin." (From the *Journal of the American Medical Association,* March 7, 1931.)

A Job for the Physician-Writer

"The Socialization of Medicine" is the title of the newest volume in the interesting little series called "The Reference Shelf," published, according to its sponsors, for the purpose of making "available, when in need of good debates, collections of articles, briefs, bibliographies, and study outlines on timely subjects for public discussion."

Publication in the series is irregular because the object is to make the material available in each instance at the time when there is the greatest need."

Apparently, then, the greatest need had arrived for a debate upon the socialization of medicine, since a volume on this subject is only now hot off the H. W. Wilson press.

Compiled by Edith M. Phelps, author of a number of similar contributions on civic subjects, this little book follows a standard procedure, presenting briefs for and against socialized practise of medicine followed by general, affirmative and negative discussion clipped from the current periodical publications.

It is interesting to note that the advocates of a socialized reorganization of medical practise are quoted from a variety of important lay publications, the *Nation*, the *North American Review*, the *Century*, the *Scientific Monthly*, and *Harpers*.

The opponents of socialization, on the other hand, being chiefly representatives of organized medicine, have apparently limited their arguments mostly to the columns of their own professional magazines, which are seldom, if ever, picked up by lay readers.

If the attitude of organized medicine is important enough for the compiler of this volume to dig out of the professional journals and line it up against the facile and diversified discussion on the opposing side of the subject in lay literary publications, it may be important enough to take its chance in the columns of these publications in the first place. Otherwise it can have little access to the intelligent lay public which perforce hears very little on the subject beyond the doctrinaire medico-social workers' rosy dream of a new world healed of standardized ills by a standardized group of government healers.

OF GENERAL INTEREST

Dr. C. A. Boreen, of Minneapolis, was recently elected president of the Minnesota Dermatological Society.

Dr. Charlotte Stickney has opened offices in the Granite Exchange Building at St. Cloud, Minnesota. Her practice is limited to Pediatrics.

Dr. Nelson W. Stewart, formerly of North Mankato, has moved to Lead, South Dakota, where he is associated with the Homestake Hospital.

Dr. J. F. Smersh of Owatonna has been appointed secretary of the Steele County Medical Society to fill the vacancy caused by the death of Dr. A. B. Hart.

Dr. Brandt Leopard, who has been located at St. Cloud for the past year with Dr. Richards, has left for Evanston, Illinois, where he will associate himself in practice with Dr. Benjamin Huggins.

The Bratrud Clinic have moved from Warren, Minnesota, to Thief River Falls, Minnesota, and occupy part of the first floor of the new St. Luke's Hospital. Dr. Edward Bratrud is Chief of Staff. Dr. A. M. Smith, formerly of St. Paul, is associated with the Bratrud Clinic as head of the X-ray Department.

MONUMENT FOR DR. MILLARD

In a recent communication from Dr. E. S. Boleyn of Stillwater attention is called to the fact that the grave of Dr. Perry H. Millard in the Stillwater cemetery is entirely unmarked.

Dr. Millard's memory has been honored and perpetuated by the University itself in Millard Hall. It would seem fitting in view of Dr. Millard's outstanding services to the medical profession of the state and considering his long services as dean of the medical school that the medical alumni acknowledge these services by a small contribution towards the erection of a suitable monument for his grave.

The undersigned committee requests that each medical alumnus of the University of Minnesota send his check for $1.00 to Dr. J. T. Christison, Hamm Building, St. Paul, Minnesota, for the erection of a suitable monument.

Recently the organization of the Medical Alumni of the University contributed the sum of $25.00 to initiate the undertaking.

There is no money available from Dr. Millard's estate for this purpose and the Legislature has declined to make appropriations for the same purpose. Your committee feels that in asking for a small contribution no hardship will be caused anyone and that in honoring Dr. Millard's memory in this manner we honor the medical profession of the state.

W. F. Braasch, Rochester
E. S. Boleyn, Stillwater
J. T. Christison, St. Paul
F. A. Erb, Minneapolis
E. L. Tuohy, Duluth
N. O. Pearce, Minneapolis

OBITUARY

Dr. Elias P. Case

1849-1930

Word has been received of the death of Dr. Elias P. Case, December 23, 1930, at his home in Oakland, California, at the advanced age of 81 years.

He came to Minnesota as a child with his parents in the early fifties, where the family lived on a farm north of Wells Lake. As a young man he drove horses for Dr. N. M. Bemis, one of the first physicians in Faribault, and studied medicine under him.

He married Emma A. Nutting, second white child born in Faribault, the date of her birth being February 17, 1856. She was the daughter of Truman and Mary Nutting, who kept the first hotel in Faribault.

In 1888 Dr. Case went to Europe, where he spent two years studying surgery in the hospitals of Germany and England.

Dr. Case and his family made their home for twenty-five years in Waterville, where he was one of the leading physicians of the community. In 1890 he built the hospital known as the Samaritan Home on the north shore of Lake Sakatah. This he operated with marked success until the hospital was destroyed by fire.

About the year 1905 the family moved to Corning, California. His wife died there in 1911. Since that time he has practiced his medical profession in Oakland, California. Two sons and a daughter survive him: Mason N. Case of Los Angeles, California; Alex T. Case and Miss Abbie Case of Oakland, California.

SCARLET FEVER TOXIN

The Dick scarlet fever toxin is regarded as a safe and efficient immunizing agent against scarlet fever. The main drawback to its use appears to be that several injections, generally not less than five, must be given before such a degree of immunity is established that the subject no longer gives a positive Dick test. (Jour. A. M. A., February 21, 1931, p. 633.)

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., ***Director***
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—Would appreciate learning what nonsurgical treatment can be tried to help a case of procidentia in a female 28 years old. The rectal (anal) sphincter is quite relaxed so that involuntary escape of gas is bothersome. Mineral oil can not be taken for the attendant constipation because of leakage. There are no polypi or hemorrhoids present. Prolapse has been coming on for six years. Does surgery now offer good prospects for cure? Is cauterization of rectal mucosa with actual cautery or chemicals a wise procedure? Are the results worth the trial?

   Answer.—In young women surgical treatment offers a good prospect of cure. In older women who cannot have the operation for one reason or another, the ordinary ring pessary may bring relief. You did not state whether or not the trouble was due to laceration incident to delivery. Sometimes relaxation of the anal sphincter is due to lesions of the spinal cord, especially spina bifida. Not all people with spina bifida have neurotrophic lesions, incident to the defect. Approximately 5 per cent of all white adults have a failure of fusion in either the lumbar or sacral vertebræ. If, in addition, the superficial layers are adherent to the deeper structures, a perforation by a dense band of fatty tissue exists or a bulging of the dura, exostosis of canal, tumor-like nodules composed of fibrous muscle and fatty tissue or nerve degeneration is present, neurotrophic effects may result.

2. *Question.*—I have a patient on whom a diagnosis of benign polyp of the stomach has been made. The tumor partially obstructs the pylorus at times, but otherwise the patient is in fair condition. Only a few gastric complaints are to be be found on careful questioning. What are the chances of this growth becoming malignant, and what should the treatment be?

   Answer.—Benign polyps of the stomach are being reported with increasing frequency. Although less than 100 are on record, many more have probably not been recorded. The average age of appearance of symptoms is between 50 and 60 (although the growth may have been present several years). Certain observers have noted a gradual transition between chronic gastritis, adenoma (polyp) and malignancy. Such growths have been produced experimentally by the use of certain irritants. Malignant transformation has been found in from 12 to 20 per cent of reported cases. Another feature which is of interest is the practically constant finding of achylorhydria with diarrhea (probably due to the absence of hydrochloric acid). Multiple polyps may be present, but if it can be demonstrated that only a small group are to be found, a partial gastrectomy is indicated. Gastric operative specimens have been observed showing both benign tumors and malignant changes.

3. *Question.*—I am going to read a paper at our staff meeting on the subject of postmortem examinations. Can you refer me to some recent publications on this subject?

   Answer.—A fine series of articles may be found in the Bulletin of the American College of Surgeons, XIV, 40:50 (December), 1930. The one entitled, "Means of Securing Postmortem Examinations," by Ralph G. Mills, M.D., Fond du Lac, Wisconsin, is especially recommended for consideration. The subject of the ways and means of securing postmortem examinations is becoming very popular, and a great amount of time and attention is being devoted to the psychological aspects of the question. When it is recalled that the number required by the various governing organizations for recognition is about the same as can be obtained by simply asking the relatives, it is appreciated that many hospitals can have much better records. There is a tendency at the present time to emphasize the actual number of autopsies or the percentages to be obtained. The quality of these examinations is equally important and should not be lost sight of in the scramble to get under the wire with the required percentage. The reasons for the examination may be summarized as follows: (1) Is the patient alive or dead? (2) Does contagious disease exist? (3) Is inherited disease present? (4) What is the cause of death? (5) disciplinary effect on all; (6) teaching; (7) to render justice; (8) to unearth scandal; (9) vital statistics; (10) insurance claims; (11) study of any rare or unusual disease; (12) to evaluate diagnostic methods; (13) scientific discovery; (14) better embalming; (15) the study of the disease (most important of all). The average work-up given to patients in most hospitals today should result in correlation between the main disease and the autopsy findings in about 85 per cent of the cases. The cults have used the old figure of 50 per cent for some time to show up the medical profession. It is to be recalled that this is based on records compiled more than twenty years ago and much progress has been made since that time. You are to be congratulated for your interest in this most "live" subject. It is recommended as a discussion theme for every staff meeting at least once a year. It is only by bringing the subject constantly before the attention of all staffs that good results can be obtained. Most autopsy permissions depend on good service rendered to the patient, and the development of any uncertainty which the family has in regard to the illness. In this way good care and attention to the patient are stimulated, and the family derives a greater satisfaction from a complete report which is possible only when an autopsy examination is conducted.

4. *Question.*—I have been asked to make a talk before a meeting of country school officers on health problems. I wonder if you have any reprints or material of any kind available that might be useful in preparing something appropriate and significant for a meeting of this kind.

   Answer.—The following articles are recommended: "Progress and Prospect in School Health Work," School Health Studies, No. 10, Department of the Interior, Bureau of Education, 1925; "Teaching Health to Ten Thousand Children," Hygeia, November, 1930; "The Classroom

(Continued on Page 370)

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

"HEALTH TEACHER" CONVICTED OF VIOLATING MANITOBA MEDICAL ACT

On Friday, January 9, 1931, John Hugh Lally, formerly of St. Paul, Minnesota, was found guilty of treating persons contrary to the provisions of the Medical Act of Manitoba, Canada. The conviction took place at Winnipeg. Lally was fined one hundred dollars and costs.

Lally operated an office at the St. Paul Hotel, St. Paul, during the month of November and departed rather hastily from the State after the State Board of Medical Examiners instituted an investigation of his activities.

The Minnesota Board co-operated with the Manitoba authorities with the above result.

In February, 1929, Lally was convicted of the same offense at Chicago, Illinois.

ST. PAUL NATUROPATH FINED FIVE HUNDRED DOLLARS

State of Minnesota vs. William H. Hirst (two cases)

William H. Hirst, fifty-three years of age, self styled naturopath, entered pleas of guilty on February 26, 1931, to two indictments charging him with maintaining an office and using the title "Doctor" in violation of the Basic Science Law.

The Hon. John W. Boerner, Judge of the District Court, sentenced Hirst to pay a fine of $500 or serve six months in the Work House for maintaining an office at 138 E. 6th St., St. Paul. Hirst paid the fine and on the other indictment charging him with using the title of "Doctor" Hirst was sentenced to a term of one year in the Workhouse, which sentence was suspended on the unqualified condition that Hirst refrain from practicing healing in any way, shape or manner in the State of Minnesota. Judge Boerner informed Hirst that if any report came to the Court that he was practicing he would be committed to the Work House without a trial. A third indictment charging Hirst with performing an abortion was filed due to the disappearance of the girl who was the star witness for the State. Hirst has been maintaining an office in St. Paul for the past fifteen years and has been quite active in the attempt of the naturopaths to secure recognition in this State. Hirst has been in the limelight considerably during the past two years following the shooting of Lieutenant Miller in an alleged quarrel over a girl. Hirst told the Court that he was married and the father of two children.

Mr. Brist, attorney for the State Board of Medical Examiners, reports very splendid coöperation from Michael F. Kinkead, County Attorney, and his staff, particularly Mr. Lynch and Mr. Bratter; also from Thomas A. Brown, chief of police. Judge Boerner is to be commended for the very rigid terms specified in connection with Hirst's refraining from re-entering the practicc of healing in the State of Minnesota.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

78th Annual Meeting

SCIENTIFIC PROGRAM

Tuesday Morning, May 5, 1931
Ball Room, Nicollet Hotel
Minneapolis, Minnesota

SYMPOSIUM ON OBSTETRICS

8:30	Pre-natal Care.	M. C. Bergheim, Hawley
8:45	Recurring Pre-eclamptic Toxemia; Its Clinical Significance.	R. D. Mussey, Rochester
9:00	Accidents of Labor.	J. R. Manley, Duluth
9:15	Infections.	L. W. Barry, St. Paul
9:30	Toxic Neuronitis in Pregnancy.	N. J. Berkwitz, Minneapolis
9:45	Discussion.	J. C. Litzenberg, Minneapolis
10:00	Intermission.	
10:15	Recent Developments in the Management of Duodenal Ulcers.	D. C. Balfour, Rochester
10:30	Carcinoma of the Uterus.	George Ward Gray, Jr., Professor Obstetrics and Gynecology, Cornell University, New York
	George Chase Christian Memorial Lectures	
11:00	When Does Disease Begin?	Charles H. Mayo, Rochester

UNIVERSITY OF MINNESOTA CLINICS

Tuesday Afternoon, May 5, 1931
1:00 P. M. to 5:45 P. M.

A. Room 129, Millard Hall, 160 seats

1:00 P. M.	Surgery	James M. Hayes
1:30 P. M.	X-ray Diagnosis	Leo G. Rigler
2:00 P. M.	Heart	S. Marx White
2:30 P. M.	X-ray Therapy	K. W. Stenstrom and Cyrus O. Hansen
3:00 P. M.	Intermission	
3:15 P. M.	Neurology	Arthur S. Hamilton
3:45 P. M.	Surgery	Arthur A. Zierold
4:15 P. M.	Arthritis	B. J. Clawson and Macnider Wetherby
4:45 P. M.	Pneumonia	Hobart A. Reimann

B. Room 102, Institute of Anatomy, 226 seats

1:00 P. M.	Medicine	Moses Barron
1:30 P. M.	Kidney	E. T. Bell
2:00 P. M.	Kidney	Hilding Berglund
2:30 P. M.	Heart	George E. Fahr
3:00 P. M.	Intermission	
3:15 P. M.	Diabetes	Archie H. Beard
3:45 P. M.	Blood	Frederick H. K. Schaaf
4:15 P. M.	Malignancy	O. J. Campbell
4:45 P. M.	Medicine	Reuben A. Johnson

C. Eustis Amphitheater, University Hospitals, 160 seats

1:00 P. M.	Cancer Gynecology	George Gray Ward, Jr.
1:30 P. M.	Pediatrics	F. C. Rodda
2:00 P. M.	Orthopedics	Wallace H. Cole
2:30 P. M.	Pediatrics	F. J. Huenekens
3:00 P. M.	INTERMISSION	
3:15 P. M.	Heart (Children)	M. J. Shapiro
3:45 P. M.	Dermatology	H. E. Michelson
4:15 P. M.	Plastic Surgery	Harry P. Ritchie
4:45 P. M.	Pediatrics	C. A. Stewart

D. Todd Amphitheater, University Hospitals, 160 seats

1:00 P. M.	Eye	Frank E. Burch
1:30 P. M.	Heart	Henry L. Ulrich
2:00 P. M.	Ear, Nose and Throat	Horace Newhart
2:30 P. M.	Malignancy	W. T. Peyton
3:00 P. M.	INTERMISSION	
3:15 P. M.	Surgery	Owen H. Wangensteen
3:45 P. M.	Obstetrics	R. T. LaVake
4:15 P. M.	Gynecology	John A. Urner
4:45 P. M.	Urology	C. Donald Creevy

Note: Make your selection now of the clinics you desire to attend. The last five minutes of each clinic period will be devoted to questions. Changes between rooms can also be made at this time. For your information clinic A is varied, B chiefly medical, C chiefly pediatrics and D chiefly surgical. If you have any special interest, e.g. heart disease, pediatrics, etc., it will be possible for you to attend every clinic by going from one room to another. There are no duplicate subjects at any time (e.g. 3:15 P. M. neurology, diabetes, pediatric heart disease and surgery). Study the list very carefully and plan your schedule now so that you will not be disappointed. Thirty-two clinics are to be presented in all. Patients will be used as much as possible. This is an opportunity presented by very few State Medical organizations, and we are proud that we have so much talent among our membership.

WEDNESDAY MORNING, MAY 6, 1931
Ball Room, Nicollet Hotel

8:30 Common Mistakes in Ocular Diagnosis.
JOHN M. ROBINSON, Duluth

8:45 A New and Effective Non-Surgical Method for the Treatment of Chronic Suppuration of the Middle Ear.
CHARLES HYMES, Minneapolis

9:00 Traumatic Abdomen. ROY RAITER, Cloquet

9:15 Tuberculin Testing. J. A. MYERS, Minneapolis

9:30 Disease of the Heart with Special Reference to the General Practitioner.
DREW WILLIAM LUTEN, Asst. Prof. Clinical Medicine, Washington University, St. Louis, Missouri

10:00 INTERMISSION (Installation of Officers)

SYMPOSIUM ON DIAGNOSIS

10:10 General Physical Examination.
E. L. TUOHY, Duluth

10:30 Intravenous Urography.
WILLIAM F. BRAASCH, Rochester

10:45 The Value of X-ray Examination of the Chest. W. H. UDE, Minneapolis

11:00 The Value of X-ray Examination of the Stomach and Gall Bladder.
H. M. WEBER, Rochester

11:15 Indications for Examination of the Colon.
E. L. GARDNER, Minneapolis

11:30 Indications for Examination of Genito-Urinary Tract. F. E. B. FOLEY, St. Paul

11:45 Indications for Spinal Puncture.
H. W. WOLTMAN, Rochester

WEDNESDAY AFTERNOON, MAY, 1931

SYMPOSIUM ON THERAPY

1:30 Poliomyelitis. J. C. MCKINLEY, Minneapolis

1:45 Trichomonas Vaginalis Vaginitis.
R. J. MOE, Duluth

2:00 Appendicitis. F. C. SCHULDT, St. Paul

2:15 Salpingitis. W. H. RUMPF, Jr., St. Cloud

2:30 Empyema. S. W. HARRINGTON, Rochester

2:45 Sinus Infections. E. R. BRAY, St. Paul

3:00 INTERMISSION.

3:15 Complications and Results of Prostatectomy.
T. H. SWEETSER, Minneapolis

3:30 Involutional Psychosis.
E. M. HAMMES, St. Paul

3:45 Fracture of the Wrist.
C. A. NEUMANN, Winona

4:00 Fracture of the Hip. A. R. COLVIN, St. Paul

4:15 Fracture of the Humerus.
H. W. MEYERDING, Rochester

4:30 Fracture of the Ankle.
J. S. HOLBROOK, Mankato

WOMEN'S AUXILIARY PROGRAM

Tuesday, May 5

Registration, Nicollet Hotel

Executive Board Luncheon, 12 o'clock, Nicollet Hotel

Executive Board Meeting following the luncheon, Nicollet Hotel

Banquet, 7:00 P. M., Nicollet Hotel

Wednesday, May 6

Annual Meeting, 10 A. M., Medical Arts Building Auditorium

Annual Luncheon, 1:30 P. M., Minneapolis Woman's Club—Followed by program of music and speaking

---

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (610 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of April will be as follows:

April 1—Health Education (Third Anniversary).
April 8—High Blood Pressure.
April 15—Health in the Home.
April 22—Nervous Exhaustion.
April 29—Cancer of the Kidney.

MINNESOTA SOCIETY OF INTERNAL MEDICINE

The Tenth Semi-Annual Meeting of the Minnesota Society of Internal Medicine will be held in the Eustis Amphitheater at the University April 13, 1931.

The fourth prize of $250.00 will be awarded by the Minnesota Society of Internal Medicine "to the practicing physician, exclusive of Members of this Society, in the State of Minnesota, who has been deemed most worthy to receive a prize in research in clinical medicine."

All physicians who are in active practice and who are legal residents of Minnesota may become candidates for the award. Physicians employed in government service are eligible if their legal residence is the State of Minnesota. Physicians who are whole-time teachers or research fellows in teaching institutions may not become candidates for this prize.

All inquiries should be addressed to, and these should be submitted to the committee before October 1, 1931.

E. T. F. Richards, Chairman,
Hamm Building, St. Paul, Minn.

PAN AMERICAN MEDICAL ASSOCIATION

The third congress of the Pan American Medical Association will be held in Mexico City, July 26-31, 1931, under the auspices of the government of the Republic of Mexico.

The purpose of the Association is to promote a more intimate understanding between the medical men of North and South America. An effort is being made to further medical contacts between English, Spanish, French and Portuguese speaking physicians of Pan America, and a cordial invitation is extended to all physicians interested.

This meeting affords an opportunity for physicians in this country to pay a visit to our sister republic; a trip which has become more and more popular in the last few years.

Officers of the association are: Dr. Francisco M. Fernandez, president; Dr. J. E. Lopez-Silvero, executive secretary; and Dr. Conrad Berenz, treasurer. General offices are at Havana, Cuba.

Further information may be obtained by addressing Dr. Francisco de P. Miranda, Executive Secretary of the Organization Committee, Departmento de Salubridad Publica, Mexico City, Mexico.

WRIGHT COUNTY SOCIETY

The Wright County Medical Society held their first quarterly meeting at the office of Dr. William Hart of Monticello, January 29, 1931.

Dr. W. A. O'Brien and Dr. W. T. Peyton, both of the University, discussed the pathology of the thyroid and its surgical treatment. The subject was handled in the light of recent scientific findings and aroused a great deal of interest. The masterly presentation by the speakers gave evidence that they had the subject well in hand. Several cases were presented by doctors of Wright County. The third speaker, Mr. A. G. Stasel, manager of the Nicollet Clinic, gave a very instructive and interesting talk on credits and collections. The keenness with which he presented his subject aroused sufficient interest in credit and collection methods to result in a committee being appointed to arrange for a doctors' independent credit bureau to be established in Wright County.

Reading of the minutes of the October meeting of 1930 was postponed until the second quarterly meeting which will be held at Annandale, Minnesota, April, 1931.

The ladies were entertained by Mrs. Frank Ellison, of Monticello. A splendid supper was served at the residence of Dr. and Mrs. Hart.

The meeting adjourned.

C. L. Roholt, *Secretary.*

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. S. S. Hesselgrave, St. Paul
Chairman Press and Publicity—Mrs. E. A. Meyerding, St. Paul
Editor—Mrs. A. A. Passer, Olivia

PANORAMIC VIEW OF THE WOMAN'S AUXILIARY TO THE A. M. A. IN FOUR ARTICLES

2. NORTH CENTRAL STATES

Mrs. James Blake

According to the Constitution and By-Laws of the Auxiliary to the American Medical Association the Organization program is carried on by the active work of the Vice-Presidents. Mrs. Southgate Leigh of Norfolk, Va., is first Vice-President and automatically Chairman of Organization. Due to her location on the map, the Second Vice-President finds herself interested in the destinies of the North Central group of states.

Looking backward with pleasant memories to Detroit, and forward with delightful anticipations to Philadelphia, we find this group of states all doing something of common interest.

In the January Journal of the Indiana Medical Society, the Auxiliary President stresses the importance of more constructive work on the part of her organized County groups. "Physicians' wives," she says, in her New Year's address, "hold an enviable position in being privileged to have a part in a world-wide health program, and I would urge every physician's wife to bring before other women *dependable* knowledge, and a just appreciation of the real spirit and purpose and actual achievements of the medical profession." So from Indiana we know we are to have constructive work during this year. Physicians as a class are not prone to participate in legislative matters but when four distinctly separate bills, which affect the profession directly, are presented during one session of a State's Legislature, it is time to be up and doing.

Such is Indiana's situation this year and the doctors of the 7th district have thought it worth while to *instruct* their Auxiliary members on these subjects that their influence may be *properly* used. The Indiana Journal never fails to give the Auxiliary space, and it is little wonder the Indiana women are up and coming, when they have such Editorial Notes to enlighten and guide them in their constructive Program work, as one finds in this same Journal.

Kansas is slowly getting a few things accomplished. A world-wide depression has rendered prophets quite fameless abroad as well as at home, but the Doctor's wife in Kansas is coming into her own, and we prophesy that the Auxiliary will climb to the top due to the indomitable spirit of the leaders in that state.

In Illinois the motto might well read—"Builders we are, and builders we must ever be. Builders, not in stone that shelters life, but builders in life." We find good constructive programs, of well-balanced educational value, we find a Journal ever ready to broadcast Auxiliary news, and best of all we find a healthy Organization line-up, and an Advisory Board from their Medical Society. Several of their County groups are having their members get busy with the "Health Audit Program."

One project of worthy mention comes from Vermillion County on the Eastern boundary of the state. The County Auxiliary put on the Health Institute in Danville last November. A member from every agency in the county working out any kind of a Health program was included in the personnel of the speakers. It was for just one day, but it was worth 365 as a rouser for Auxiliary work. It really was sort of a Christmas Seal Campaign opening, a get-together of Club Women and P. T. A. groups in the County. And what a wise idea for a Medical Auxiliary to have the head lines in the plans for such a "Health Day."

Wisconsin, Iowa and South Dakota are among the latest States to join the National Auxiliary. Organization is the keynote for their work, and the National Study Envelopes are offered as program material. Right now if the modern Doctor's wife needs to get one thing more than another from her organization, it is the knowledge of what is going on in this world; especially the world of Medicine. Women are discriminating more carefully in the clubs they are joining. They are asking what membership will mean to them, what they will get out of it. For that reason the subjects for study should be more carefully chosen, and the roll call should be made to count for something more than jokes and quotations from forgotten poets. It isn't a pleasant feeling for a busy mother who rides miles to a meeting to say when it is all over—"I can't say I know any more now than when I started." And so we find these three states getting themselves established on a firm foundation, with the National program envelopes scattered far and wide to aid and encourage Auxiliary members, already in, and prospective members.

Montana and North Dakota are debating pro-and-con, but as Mrs. Hoxie said in her Detroit report—"I believe it will be a mistake from now on to organize a new state, unless it appears reasonably certain that there is interest enough among the Doctors who want the Auxiliary, so they will foster it and stand back of it." And so we leave Montana half hearted about forming an Auxiliary, and North Dakota in the air.

We find Michigan giving intelligent co-operation with state and county officials. Women, like men, are interested in the improvement of civic affairs and healthful living and are realizing that they need to be armed with a definite knowledge of health laws and public health practices.

Missouri is in a very healthy condition. We find that Mrs. A. B. McGlothan, the President-Elect of the Woman's Auxiliary to the American Medical Association, will attend President Hoover's White House Conference for Child Health and Protection to be held in Washington, D. C., February 19 to 21. Mrs. G. H. Hoxie, the President for last year, will also attend the White House Conference.

Mrs. A. W. McAlester tells us the women of Missouri are finding the Study Envelopes, published by the Education Committee of the Woman's Auxiliary to the American Medical Association, most interesting and instructive. The Studies on "Common Defects in Children," and on "Diphtheria," "Smallpox" and "Typhoid Fever" were recommended by the Department of Health in the Missouri Branch, National Congress of Parents and Teachers, for use on Parent Teacher Programs. Eight hundred copies of each were distributed for use in Parent Teacher Units. Three hundred were requested and supplied for use in Parent Education Classes. Requests are constantly coming in for additional copies of the studies for use by teachers and Parent Teacher Units. The Department of Public Information of the Extension Division of the University of Missouri is including these studies in its suggested programs for clubs in the Missouri Federation of Women's Clubs, and P. T. A. programs. This department requested back numbers of Hygeia for use in such programs. Three hundred copies of Hygeia were supplied by women in the state and by the circulation manager and are being extensively used in club programs. The Missouri Chairman of Public Relations is planning to have a copy of each of the studies "Common Defects in Children," and "Communicable Disease Control," sent to each county school superintendent in the state. Several of the County Auxiliaries are using the study envelopes in their programs.

Mrs. M. P. Overholser of Harrisonville, Mo., has been appointed chairman of Public Relations in the Missouri Auxiliary. This Auxiliary maintains a scholarship for a medical student, per capita quotas being assigned to each county Auxiliary.

They also have sent in 30 per cent of the total number of Hygeia subscriptions recorded from all Auxiliaries from January 1, 1930, to January 1, 1931. Some county Auxiliaries provide Hygeia for all their teachers. Among these are Buchanan, Gentry and Lafayette. Cape Girardeau County Auxiliary has just finished paying a $1,000.00 pledge to a hospital in the city and is now ready for another kind of work. They are a live group and certainly work hard to be able to accomplish so many wonderful worth while things.

Minnesota, the North Star State, has had a busy and successful year on organization. The President and Organization Chairman have visited over the state and planned meetings and Educational programs with many County Groups. In October the International Medical Assembly met in Minneapolis, and at this time the Hennepin County Auxiliary celebrated its twentieth Anniversary, by being hostess for five days to the visiting Doctors' wives. A great many social affairs and an Educational Day, which included a speaker on Public Health, were features. Hennepin County is having a year with a definite program. Each month a speaker is scheduled, and one meeting during the year is reciprocity day and each Auxiliary in the state is invited to send visitors. This group features Philanthropic work for T. B. patients at Glen Lake and does much for the Library at the Sanatorium. They have helped the Medical Society furnish their Library and Club Rooms, spending $1,000.00.

Ramsey County does much the same work. They have a Scholarship Fund for Medical Students. St. Louis County is noted for work in the Public Relations Field. One of the other Counties takes care of a Nurse's Scholarship. The Minnesota Auxiliary has a splendid Advisory Board and a page in the State Journal. The President was one of the speakers on the program for the Annual Conference of Secretaries of the Component Societies of the Minnesota State Medical Association, held in St. Paul the first week in February. This is the first time the Auxiliary has been asked to take part in this Annual affair. Mrs. Hesselgrave spoke on "Uses of the Auxiliary."

And so closing my review of the work of the North Central Group of states may I say again:

Builders we are, and Builders we must ever be
Builders not in stone that shelters life, but
Builders in life itself—ever remembering the future of the world for generations to come depends upon what we *think* and *will* and *do* today.

HENNEPIN COUNTY AUXILIARY

The first regular meeting of the year 1931 was held in the lounge of the Hennepin County Medical Society rooms in the Medical Arts Building, February 18, at 2:30 P. M. Mrs. Martin Nordland, the new president of the auxiliary, was in the chair. She introduced Dr. Stephen H. Baxter, president of the Hennepin County Medical Society, who spoke briefly in appreciation of the services the auxiliary was rendering to the profession and suggested some ways in which the auxiliary can be of definite service to the medical society. He was followed by Dr. J. A. Watson, who discussed the question of medical ethics in a most interesting manner.

Mrs. James Blake presented the need of a Psychopathic Hospital in Minneapolis. The Hennepin County Auxiliary went on record as endorsing this movement. The newly appointed committee chairmen submitted the names of their committee members and outlined their plans for the year. It was decided to give an afternoon card party in the Hennepin County Medical Society rooms the Monday after Easter for the benefit of the Philanthropic Fund, and an evening party in the fall to which the husbands of the members of the auxiliary will be invited.

Plans for the entertainment of the women accompanying the doctors who will come to the State Medical Association in May were discussed. The meeting was followed by a tea and social hour with a musical program of songs given by Mrs. Herbert W. Jones, accompanied by Mrs. J. C. Wilcox.

MEEKER COUNTY AUXILIARY

Meeker County Auxiliary was organized the eleventh of February and voted to affiliate with the state and national associations. Mrs. James Blake, Hopkins, chairman of organization, and Mrs. Hewson, of Stillwater, were guests at the meeting, which was held in Litchfield. Mrs. A. W. Robertson, of Litchfield, was chosen president; Mrs. Brigham, of Watkins, was elected vice president; Mrs. G. A. C. Cutts, of Litchfield, was made secretary and treasurer.

MOWER COUNTY AUXILIARY

A women's auxiliary to the Mower County Medical Society was organized at Austin, the twenty-fourth of February. Mrs. S. S. Hesselgrave, Mrs. Edward Schons, Mrs. Hengstler, officers of the State Auxiliary, motored to Austin to attend the meeting. Mrs. Hesselgrave gave a splendid talk on the national, state and county auxiliaries. An open discussion followed and the group elected Mrs. A. W. Allen, president; Mrs. M. W. Morse, of Le Roy, vice president; Mrs. P. A. Lommen, of Austin, secretary, and Mrs. G. E. Hertel, treasurer.

OLMSTED COUNTY AUXILIARY

A regular business meeting of the Olmsted County Auxiliary was held at the home of Mrs. W. F. Braasch, Rochester, the twelfth of February. Mrs. Hesselgrave, state president, and Mrs. Edward Schons, state corresponding secretary, were guests at this meeting. The auxiliary voted to join the State Women's Auxiliary at this meeting, and is thereby automatically affiliated with the national association. Mrs. J. E. Crewe, retiring president, presided at the business session. Mrs. M. S. Henderson was chosen president to succeed Mrs. Crewe; Mrs. George Steven of Byron was elected vice president; Mrs. F. C. Dolder, of Eyota, was made secretary, and Mrs. G. T. Joyce was made treasurer. The Olmsted County Women's Auxiliary is making its chief activity the cutting of garments for the Red Cross.

ST. LOUIS COUNTY AUXILIARY

The St. Louis County Auxiliary has had an active year under the direction of Mrs. F. N. Knapp, of Duluth. Other officers are first vice president, Mrs. F. F. Slyfield; second vice president, Mrs. F. J. Lepak; secretary, Mrs. T. O. Young; corresponding secretary, Mrs. W. N. Graves; treasurer, Mrs. A. J. Bianco. Food, clothing and toys were distributed to fifty-two families at Christmas. Mrs. Hesselgrave was a guest at the January meeting, at which a Chinese luncheon was served and a play was read by Miss Hoffman. A dance was given in January and the doctors and their wives from Superior were guests.

The auxiliary plans in conjunction with all of its meetings an educational program, such as book reviews, talks by prominent doctors, discussion of public relations. Books have been donated and each member has pledged to earn or donate three or more dollars for the philanthropic work.

RED RIVER VALLEY AUXILIARY

Officers for the Red River Valley Auxiliary are: President, Mrs. W. H. Hollands, Fisher; first vice president, Mrs. Bernard, Thief River Falls; second vice president, Mrs. C. L. Oppegaard, Crookston; secretary, Mrs. O. L. Bertelson, Crookston; treasurer, Mrs. J. F. Norman, Crookston. At the annual meeting in December Mrs. Emil Geist of Minneapolis was a guest of the auxiliary.

RICE COUNTY AUXILIARY

On the evening of February fourth, Dr. and Mrs. J. M. Murdoch entertained the members of the Rice County Medical Society, the auxiliary and nurses at a banquet, followed by music and dances. Dr. Murdoch presided at the business meeting of the medical society. The auxiliary was represented on the program by Mrs. Murdoch, who read a paper on "Health Work Interests." Dr. Schesselman, of Mankato, gave a talk about the meeting of the Southern Minnesota Medical Society, which will be held in Faribault in June. Dr. Horace Newhart, of Minneapolis, gave an illustrated lecture on mastoids. Out-of-town guests were: Dr. and Mrs. Newhart; Dr. Bedie and Dr. Swanson, of Cannon Falls, and Dr. Schesselman, of Mankato.

WASHINGTON COUNTY AUXILIARY

A one o'clock luncheon meeting at Lowell Inn, Stillwater, featured the February meeting of the Washington County Auxiliary. Mrs. John W. Stuhr, president, called the meeting to order. Paul Fesler, superintendent of the University Hospital, gave an illustrated lecture on what the University Hospital is doing for the people of the state.

CONSULTATION BUREAU

(Continued from page 364)

Teacher and Health Education," Hygeia, October, 1930; "How Is Your Child's Health Equipment," Hygeia, November, 1930. An article is to appear in the April number of EVERYBODY'S HEALTH under the division of Health for Teachers and Pupils entitled "New School Health Records Valuable." This is a discussion of the new health record card and its uses. As you probably know, permanent health records of all school children are now required by law, and this article deals in detailed way with the law, its application and possibilities. The Millbank Memorial Fund, quarterly bulletin, July, 1925, deals with rural school health work, and may also be of value to you. By all means read the April number of EVERYBODY'S HEALTH, as this matter is of vital importance to every practicing physician in Minnesota.

PROCEEDINGS OF THE REGIONAL CONFERENCE*

Those present at the Conference were: Mr. Theodore Wiprud, Milwaukee, Wis.; Dr. Otho Fiedler, Sheboygan, President-Elect, Wisconsin State Medical Association; Dr. W. F. Braasch, Rochester, Minn.; Dr. H. W. Skelsey, Secretary, Fargo, N. D.; Mr. J. G. Crownhart, Secretary, Wisc.; Dr. C. B. Wright, Minneapolis, Minn.; Dr. E. A. Meyerding, St. Paul, Minn.; Dr. H. M. Workman, Tracy, Minn.; Dr. W. A. Rohlf, Waverly, Iowa, President; Dr. George Earl, St. Paul, Minn.; Dr. L. Sogge, President, Windom, Minn.; Mr. Vernon Blank, Managing Director, Iowa; Dr. Andrew Carr, President, Minot, N. D.; Dr. O. E. Locken, Crookston, Minn..

AUXILIARY

Dr. George Earl, St. Paul, Chairman of the Committee on Public Health Education, opened the informal discussions of the Conference with a suggestion for a definite, constructive program of coöperation between the women of the State and County Auxiliaries and the organized Medical Profession. Dr. Earl declared that the women are anxious to help and ask only that the medical profession assume definite leadership in their program.

The following plan was drawn up in the discussion that followed:

1. Auxiliaries should be asked not to pass resolutions on any health or medical questions, particularly in legislative matters, without the approval of the Legislative Committee of the State Medical Association. The same course should incidentally be recommended to county medical societies and any other organizations of the medical profession. It was the emphatic sentiment of the group that endorsement of most movements pertaining to health and medical care, to sociological and economic matters, should be confined to the principle involved and not the particular measure proposed.

2. A definite scheme for securing the presence of Auxiliary members on the boards of all lay women's organizations was considered advisable. Such a scheme could be modeled upon the similar plan of the Hennepin County Medical Society.

3. Auxiliaries should be instructed to inform themselves thoroughly about the health and public welfare activities of all women's organizations.

4. They should share with the various branches of organized medicine the obligation to present the truth about health to the public. It is also their responsibility to see that those to whom they delegate this important function, whether medical men or laymen, are qualified for the task.

5. Every county society should have a committee that will actively coöperate with and advise its Auxiliary. Initiative should be developed in each local unit for the work.

SPEAKERS' BUREAU

Public education in matters relating to health should come from the medical profession, members of the Conference agreed. There is a lively public interest in these matters today. If the medical profession does not satisfy it legitimately someone else, less well qualified, will. The task of public health education cannot be delegated to other agencies without loss of medical prestige.

---

*Regional conference of officers of the State Medical Societies of Montana, North and South Dakota, Iowa, Nebraska, Wisconsin and Minnesota, held in St. Paul, February 8, 1931.

Conference members urged practical training in public speaking upon the physicians who are to do this work. They pointed out very definitely that no individual benefits, in their experience, ever came from speaking before lay groups and that the ancient notion that a practising physician may not ethically speak in his own community is out-worn and obsolete.

In the main, talks to the laity by the medical profession should tell what scientific medicine means and what its contribution has been to modern life and modern health protection. It was pointed out that many people in the United States do not, even now, know the difference between the varieties of groups using the designation "Doctor." It is the duty of the medical profession to tell them.

PUBLIC RELATIONS

Dr. O. E. Locken, Mayor of Crookston, pointed to the public relations of the medical society he represents as an example of successful civic functioning of a unit of organized medicine. Physicians have assumed direction and control of public health and sanitation in his community. They inaugurated milk inspection and take the lead in every type of welfare activity. A yearly medical economics meeting is part of his county society's program.

Wisconsin members reported that copies of De Kruif's "The Microbe Hunters" were sent to all members of the Legislature this year through their family physicians.

In these matters, the Conference agreed, it should be the function of the American Medical Association to stimulate the state associations and for the state associations in their turn to stimulate the county societies.

SOCIALIZATION OF MEDICINE

Conference members agreed with Dr. Otho Fiedler of Wisconsin, that Social Medicine is definitely on the way in America. The Medical Profession must be ready for it.

In medicine, as in all branches today, they pointed out, the great problem is distribution. The problem of distribution of medical knowledge increases and becomes more complicated with increasing medical knowledge. In America it is still possible for the medical profession to take the initiative in solving the problem of bringing to the individual the products of medical science at a price the individual is able to pay.

In Europe twenty-three countries have a system of compulsory socialized medicine. Dr. Fiedler said that seventeen have voluntary social medicine. Canada is engaged in socializing its medical service and even in the State of Massachusetts a bill has been introduced into the State Legislature, providing for employment of the medical profession by the state. Current magazines are full of articles on this phase of medical development.

Socialization of medicine in America has interesting and important possibilities in the opinion of the Conference. But the Medical Profession should be ready with a policy or plan when it comes. Conference members felt that the American Medical Association is failing to take proper cognizance of the situation. They felt that every county medical society should be studying the problem.

The following suggestion for acting by the conference was made by Dr. Fiedler: "It is the sense of this body that the question of social medicine is of pressing enough importance to warrant a thorough study and compilation of statistics on the whole question; that every state association should be collecting material which should be available to all who make inquiries on the subject and that a copy of this suggestion be sent to Dr. Olin West, Secretary of the American Medical Association, for his coöperation and assistance in avoiding duplication."

It was the opinion of the conference that every state association should organize a committee also to study the question.

Mr. J. G. Crownhart, Executive Secretary of the Wisconsin Medical Society, suggested that the following material might be helpful.

Some Medical Problems Ahead, W. C. Rappleye, M.D., Director of Study Commission on Medical Education, New Haven, Conn.
Some Problems of Medical Service, W. C. Rappleye, M.D., New Haven, Conn.
Canadian Public Health Journal (outlining the progress of State Medicine in Canada), December, 1930. Toronto.

Current economic problems of the profession in America were grouped for discussion under the following heads:

1. Legislation.
2. Lay Organizations.
3. State Boards of Health.
4. The University Medical Schools.

The Iowa plan for care of the indigent sick by contract between the county medical society and the authorities in charge was discussed with reference to a decision recently handed down by the Supreme Court of California, relative to the practice of a profession by a corporation. By this decision, corporations will be prevented from practice either of medicine or law, in California. Mr. Vernon D. Blank of Des Moines, Iowa, Managing Director of the Iowa State Medical Society, indicated that Iowa county medical societies, who are parties to contracts for the care of the institutionalized sick, might, in the future, sign their contracts individually rather than as a corporation.

Dr. West's attitude toward the growth of contract practice, in that it tends to stimulate a situation which the medical profession should particularly wish to avoid, was mentioned.

The conference agreed, however, that some form of collective bargaining in medicine as in other things was inevitable. The question is now, "Who is to do the bargaining?" Somebody has to negotiate in these matters with insurance companies, industries, legislators. For the good of the public as well as the doctors, the conference believes it should be the medical profession.

There is a tremendous economic waste in America due to poor health and unwholesome sanitary conditions. The first survey of public health to indicate this condition was made in Roosevelt's time, conferees recalled.

It is obviously up to the medical profession to lead in checking this serious economic loss in America, they believe. The State has a right to expect it. The great need today of the medical profession, as well as the public, is medical statesmen to do the job.

Group Insurance was discussed as the logical policy for protection of the individual in any system of contract practice. Such group malpractice insurance is the rule under the Iowa plan.

STATE BOARD OF HEALTH

It was agreed by the Conference that physicians employed in public health work, in state institutions, in state enterprises, railroad corporations, city institutions and in public service, should be required to be members of the County Medical Society of the locality. The presence of members of the State Association on the State Board of Health was thought to be the best means of securing such standards on the part of the hiring groups. It was suggested that influence brought to bear from the State Board of Health is more effective and politic than legislation in such matters.

SCIENTIFIC SOCIETIES

The value of such societies as the Interstate Post Graduate Assembly, the American College of Physicians and the American College of Surgeons was admitted by the conference. It was the sentiment, however, that all of them might better be integral parts of the American Medical Association.

LEGISLATION

North Dakota representatives outlined pending bills before the legislature in North Dakota which include: a Registration Bill, a Hospital Bill (admitting cults), a Basic Science Bill and a Naturopath Bill. In connection with compulsory registration law now pending in North Dakota, the Conference was told that Minnesota is much pleased with its own registration law.

COUNTY SOCIETIES

The American Medical Association is at work on a model constitution for county medical societies. Such a constitution should, in the conferees' opinion, offer considerable help in dealing with difficult problems of expulsion from county medical societies and of dealing with the narcotic traffic.

SUGGESTIONS FOR FUTURE NORTHWEST REGIONAL CONFERENCES

It was agreed that all of the delegates to the American Medical Association from the Northwest states should attend these regional conferences. Such a plan would secure agreement and group action among the Northwest delegates on matters of vital importance.

It was also suggested that a representative from the Bureau of Legal Medicine and the Bureau of Medical Economics of the American Medical Association be invited to attend next year's conference.

Conference groups should be kept small, however, to facilitate informal discussions, it was generally agreed. For the 1932 program it was suggested that three or four problems be selected for particular consideration. Each member of the conference will have an opportunity to make his own suggestions for the choice of problems.

Mr. Crownhart proposed that between meetings, confidential information might, with benefit, be passed around periodically between the states. He suggested that each society be asked to send something on to its fellow societies once a month. For necessary mimeographing and mailing he offered the facilities of his Wisconsin office.

It was decided that the 1932 meeting would be held in the Twin Cities as the most convenient centers to the states involved. Appreciation for this year's entertainment was expressed to Minnesota.

ELECTION OF OFFICERS

Dr. Otho Fiedler, Sheboygan, Wisconsin, President-Elect of the Wisconsin State Medical Society, was elected President of the Conference; Mr. Vernon D. Blank, Des Moines, Iowa, Managing Director of the Iowa State Medical Society, was elected secretary. Dr. Fiedler, as President, is also to act as Chairman of the Program Committee.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of February 11, 1931

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 11, 1931. After dinner at 7 o'clock, the meeting was called to order by the President, Dr. J. S. Gilfillan. There were thirty-nine members and one visitor present.

In the absence of the Secretary the minutes of the January meeting were read by Dr. Carl Drake.

Dr. F. R. Wright (Minneapolis) read the following memorial of the life of Dr. F. A. Dunsmoor:

Frederick A. Dunsmoor was born May 28, 1853, in Harmony, a small town later called Richfield, and now a part of Minneapolis. He died on December 16, 1930, at his home in Hollywood, California.

In his death American surgery and this Academy have sustained a grievous loss. His scheme in life was to improve his own qualifications and continuously advance the progress of his profession.

He began the vocation of his choice early in life; at the age of sixteen he entered the office of Doctors Goodrich and Kimball to study mdicine. He acquired his preliminary education in a Minneapolis High School and the University of Minnesota, and pursued his medical education in the Bellevue University and Hospital of New York City. Upon his return to Minneapolis he entered into partnership with Dr. H. H. Kimball, commencing to practice independently in 1877. He was a dominant factor in all of the medical schools which led up to the organization of the Medical Department of our State University.

Dr. Dunsmoor bought the Winslow House and started the Minnesota Hospital College and served as its vice-president and Dean; he was also the Professor of Surgery, and Surgeon to the Dispensary connected with this institution. He aided the Professor of Ophthalmology to establish an Eye, Ear and Nose Clinic which led up to the establishment of the Departments of Ophthalmology and Otolaryngology now existing in our Minnesota State University.

He was one of the founders of the Asbury Hospital and for many years the leading surgeon on the staff. Following this he became associated with the Swedish Hospital. When the Medical Department of the University was organized in 1888 he was appointed to the chair of Clinical and Operative Surgery, which he held until 1913. During the last ten or twelve years of his active career his work was done at St. Barnabas' Hospital. He was one of the pioneer surgeons of Minnesota during the days when native genius and devotion to science were the chief elements that led to success.

In addition to being a constant student, encouraging research, original in thought and technic, a magnetic teacher, and an able clinician, Dr. Dunsmoor was a gifted writer, publishing his articles on his specialties in the leading medical journals of the country. He was keen in debate. He had a flare for picking out the valuable points in papers, to which he listened attentively, thus emphasizing their importance. He did not confine his usefulness to his profession but took a keen interest in civic affairs and the general welfare of the community and thus became an eminent citizen.

Dr. Dunsmoor took an active part in the meetings that resulted in the formation of this Academy. He nominated its first president. The continuous, growing success of this medical society, which its history demonstrates, was greatly aided by his activities in its proceedings.

Early in life he established the habit of taking a vacation each year, during which he would visit the larger hospitals and scientific centers in this country and abroad. One of his chief characteristics was his ability to do an enormous amount of work apparently without fatigue. He was a wonderfully dexterous operator, as hundreds of his devoted students throughout the country will testify. He was a lover of Nature, spending a great deal of his time in the country and in travel. He loved "the spirit of the lakes and the seas and rivers."

His domestic life was delightfully pleasant, as all those who had the privilege of visiting his fine home on Tenth Street in Minneapolis will testify.

In addition to all his virtues was the gift of friendship; fortunate were those who enjoyed it. His wide range of travel and information and well-stored mind rendered his companionship most enjoyable and profitable.

To his two daughters, Mrs. Homer P. Clark, St. Paul, and Mrs. Frederick W. McCartney, Denver; a brother, Dr. John Dunsmoor, Los Angeles; and three nieces in Minneapolis, Mrs. A. W. Armatage, Mrs. Horace Lowry and Mrs. N. H. Scheldrup, we extend our profound sympathy.

(Signed) JOHN F. FULTON, *Chairman*,
EMIL S. GEIST,
FRANKLIN R. WRIGHT,
Committee.

DR. GEORGE N. RUHBERG (St. Paul) read his thesis, entitled "Paresis and Malaria." (To appear in MINNESOTA MEDICINE.)

DISCUSSION

DR. W. H. HENGSTLER (St. Paul): I want to express my appreciation of this fine thesis which Dr. Ruhberg has presented upon a very pertinent subject. I was very much impressed by the emphasis which he placed on the early diagnosis of syphilis, and I want to concur with him in that. I think if more syphilis of the central nervous system were recognized early we would have less need for the malaria treatment. I should like to call attention to the fact that in certain provinces of China (concerning which I had occasion to read in looking up the literature on this subject a few years ago), where malaria predominated among the native population, although syphilis is very prevalent there is positively no neuro-syphilis known. These observations were made by a man named Nathaniel Berkowitz, who was located in China.

Dr. Ruhberg stated that the relationship of malaria to syphilis is not known. I believe that is true. I believe that the mechanism by which the malaria acts upon the syphilis is as yet unknown, but this Chinese situation would indicate that there is some relationship between the prevalence of malaria and the occurrence of syphilis in the blood stream, but not in the cerebrospinal system.

Attention should also be called to examination of the pupils of patients who are suspected of having syphilis. Pupillary fixation to light and accommodation will often give the early diagnosis of cerebrospinal syphilis before any other manifestations are present. The question of the relationship between the clinical symptoms and the serological findings in neurosyphilis, particularly in the patient who has been under treatment and as to whether or not he is cured, is one of importance. At the meeting of the Central Neuropsychiatric Association which was held in Ann Arbor, Michigan, some three or four years ago, Dr. Camp and his associates presented some of their work in neurosyphilis and called attention to the fact that the clinical picture was much more important than the serological findings. If a man obtained a remission, the presence of positive serological tests was not regarded as anything to worry about particularly, as long as the clinical picture remained satisfactory, unless of course the spinal fluid was becoming more actively positive.

Dr. Ruhberg stated that cases of paresis for malarial treatment must be carefully selected. In this I also agree with him. One cannot treat paretics with malaria indiscriminately, because so many of them are so low in vitality and physically depleted that the malaria treatment would kill them; so a proper selection of cases for this type of treatment is of the utmost importance, and no case should be selected who is not physically fit to stand the malaria onslaught. Finally, I believe that it must be conceded by all that the proper place for treatment of paresis with malaria is in an institution. The private practice of neurology, as the ordinary practitioner carries it out, is hardly the place to treat with malaria. In an institution a large number of cases are handled and there the malaria strains can be kept active all of the time and the patients can have the adequate facilities for proper care.

Again I wish to say that Dr. Ruhberg's paper was very fine, and that I appreciated hearing it.

Dr. F. R. Wright (Minneapolis): When one tries to reason out why malaria affects late cases of syphilis he must review those facts which bring about the cure or control of syphilis. A man infected with syphilis produces in the body certain protein substances called antibodies or immuned bodies, the detection of which is called the Wassermann reaction. We treat the patient with salvarsan, mercury or bismuth, but none of these kill spirochetes. When these drugs are introduced into the body, they stimulate the tissues to produce a toxalbumin, which is a stronger spirocheticide than those protein substances produced by nature. When the tissues of our patient become so accustomed to the presence of arsenic, mercury and bismuth that they no longer respond and produce a toxin-albumin, which will destroy the spirochetes, we must find some substance to replace them which will produce a toxalbumin capable of destroying these spirochetes. This we find in malaria. The growth of the plasmodium malariæ in the body produces a certain protein substance which gives a Wassermann reaction. Whether these protein substances produced by malaria are the same as those produced by the presence of syphilis, we do not know, but they undoubtedly are of a similar nature. Is it not possible that these chemical substances produced by the growth of malaria are able to destroy or control the disease even after those substances produced by the presence of spirochete, or by the administration of arsenic, mercury and bismuth have failed?

Dr. E. M. Hammes (St. Paul): Dr. Ruhberg's paper is a very timely one. Any paper that calls attention to the early diagnosis of neurosyphilis is timely, for the earlier we recognize and diagnose these cases the less will be the destructive changes and the more favorable the prognosis.

Syphilographers tell us that syphilis in this country is on the decline. Lida J. Usilton, in a study of the prevalence of venereal disease in the United States, estimates that there are approximately 1,500,000 active cases of venereal disease, out of which about 700,000 are active cases of syphilis. To this must be added the large group of cases which are not under treatment and the still larger group which have positive blood Wassermanns and are asymptomatic.

In about 30 per cent of the cases we obtain a history that the patient has had no knowledge of having had a previous syphilitic infection. In neurosyphilis as a group the blood Wassermann is negative in about 50 per cent of the cases. For that reason the early and thorough spinal fluid study is essential in every suspected case and in every organic neurologic case where the diagnosis is in doubt.

The psychoses associated with syphilis of the brain come under two large groups. The one group comprises vascular syphilis associated with the psychosis. The second group comprises the genuine cases of general paresis. There are many instances in which one is unable to differentiate between the two conditions except that perhaps in the former group the response to antisyphilitic treatment is much more rapid and much more favorable.

We frequently speak of the paretic spinal fluid syndrome, characterized by a moderately high cell count and a 4 plus Wassermann and a typical paretic colloidal gold curve. However, this serological picture does occur in other forms of neurosyphilis. I recall a patient who to my knowledge has had a typical paretic spinal fluid syndrome since 1919, who is perfectly well today except for a dilated pupil and who has never manifested the slightest evidence of paresis.

Malaria undoubtedly is the best recognized treatment for general paresis. It is fraught with a certain amount of danger. According to statistics from the various clinics there is a death rate of approximately 20 per cent directly due to the malarial infection. However, we are dealing with a fatal, degenerative disease and our attitude toward this treatment should be the same as some of the heroic forms of treatment which the surgeon uses in his cancer problems.

Prior to the introduction of the treatment by malaria we were unable to secure a negative spinal fluid in a case of paresis in spite of the fact that we gave these patients thorough and prolonged treatment, both intravenous and intraspinous, for a period of months and months. Since we have been using malaria in our treatment of paretics we not only have had a greater percentage and longer remissions, but have obtained negative serological findings in the spinal fluid in a fairly large group. Sometimes these favorable serological findings do not manifest themselves until months or even a year after the discontinuance of the malarial treatment.

Definite contraindications to malaria are particularly, hypertension, the various forms of nephritis, evidences of myocardial degeneration, and a general devitalized state of the patient. I recall one case of general paresis with a blood pressure of 220/115 in which we gave malaria. With each chill the blood pressure showed a definite drop. After five chills the blood pressure was 85/40 and the patient went into a state of collapse. Quinin was given immediately, intravenously, and various stimulants, and, fortunately, the patient rallied and did not die. The only death we had in our series was in a favorable case from the constitutional standpoint. On the seventh day following the injection of malaria he developed a chill with a temperature of 104°. This temperature did not drop as one usually expects, but continued between 103 and 104 degrees. The patient became unconscious and died within three days. We were unable to obtain a postmortem, but in all probability this patient died from the rare complication where the malaria organism forms multiple thrombi in the smaller cerebral blood vessels and in that way produced a picture of stupor and hyperpyrexia.

Dr. F. R. Wright: That is only about 10 per cent of the estimate of venereal disease ten years ago. In 1896 Professor Taylor of New York wrote a book on venereal diseases in which he estimated about 5,000,000 people in this country had syphilis, or about 1 person out of every 15.

Dr. S. E. Sweitzer (Minneapolis): We have had a small series of patients treated with malaria—sixty or more. We have used it now for about six years and our results have been about the same as the results reported by others. There have been about 30 per cent remissions, that is, placing the patients into occupations or their previous occupations; 35 per cent were benefited and about 35 per cent did not get any benefit. In checking them over, I think the results are in proportion to the degree of deterioration. If we get them early we get better results. There are some things one should do before giving malaria. In the first place the patient should be put into as good condition as possible. I think out of our 60 cases there have been 4 or 5 deaths. First, give them quinin and if they react to quinin do not give them malaria. Then we give them about 8 or 10 chills, but if the patient is not getting along well we interrupt after giving 4 or 5 chills; it is better to interrupt and have a live patient.

Another question is, why do we have paresis? Almost all of it has been somebody's fault. The patient doesn't know, or some doctor has not done his duty by the patient. If these patients are given intensive treatment over a period of three years or more almost none of them will develop paresis, but they often get treatment for a few months or a year and then stop.

Then the use of malaria in cases other than paresis, such as Wassermann fast cases and tabetics. In Vienna they are treating all syphilitics that show signs in the spinal fluid with malaria and they think that prevents neurosyphilis. I think this is a big advance in the treatment of syphilis.

Dr. Hammes: Have we any definite means by which we can determine when the syphilitic is cured, aside from again re-infecting him in order to determine whether he develops another chancre?

Dr. Sweitzer: About 97 per cent of them will not develop nervous syphilis if you can give them treatment over at least three years. Almost invariably the patients we get with nervous involvement have had a few months, often not a year, of treatment. But if you give them at least three years of intensive treatment and then check the spinal fluid, I think you will find that neurosyphilis will practically disappear.

Dr. C. N. Spratt (Minneapolis): I would like to ask two questions: first, how do you give these patients malaria? In 1901, when I was House Officer in Johns Hopkins Hospital, malaria was common; we had a malaria patient in one bed, a typhoid in the next, and a pneumonia in the next; the windows were unscreened, so there was opportunity for getting malaria. Where do you now get the malaria organisms, especially in Minnesota, to give to these patients?

Second, I wonder if anything has been done along this line with foreign protein, or low or high frequency current, and diathermy.

Dr. Ruhberg (in closing): I wish to thank the gentlemen for their very kind discussion of my paper. I did not include any of the cases of frank paresis in this paper for the reason that it is practically conceded the world over that malaria at present is the best treatment for paresis and it would be merely a repetition. I included only those patients in which one could not make a clinical diagnosis of paresis, but who are in danger of later developing paresis or tabes. Personally, I feel that a person with negative spinal fluid, who has had syphilis, has a very good chance of not developing a parenchymatous neurosyphilis. I would not be willing to state that such a person who has a negative spinal fluid will never develop neurosyphilis.

If we are going to do the right thing by our patients it is necessary that we discover the presence of a neurosyphilis early and treat it until all serological signs disappear. In the severe cases, such as described by Moore in his Class 3, or pre-paretic type, it will be found that malaria is often needed to bring about this result. We have all had experience in treating late cases of paresis in which the patient may have been saved and a negative spinal fluid finally obtained, but so much parenchymatous destruction had taken place that the treatment merely improved the patient to the level of a high-grade imbecile, or placed him in the feeble-minded class, and as a result has caused great distress to the family in handling and taking care of him. In these cases the treatment certainly could not be classed as successful, and in many cases it would have been better not to have given malaria at all.

In answer to Dr. Spratt's question, we draw 10 c.c. of blood from the vein, and treat it with citrate to prevent coagulation, and then keep it warm until we are ready to re-inoculate. Four c.c. of this citrated blood is given intravenously, and as a rule would begin to cause a rise in temperature in 7 to 10 days. I purposely did not mention typhoid in the treatment of paresis, but include that in the reasonable treatment that could be given before malaria. There is no question but that typhoid is safer and is very valuable. Some claim that it is as good as malaria. However, it has not had the world-wide recognition that malaria has in obtaining the lasting and satisfactory remissions. Fever may be the major factor in the treatment by malaria, and diathermy is being used in an experimental way, and the few reports are enthusiastic.

Dr. Hammes' estimate that 20 per cent of these patients die of malaria is rather high, I believe. The usual statistics I have read give the mortality as around 10 per cent, and it must be remembered that these cases include patients with frank clinical paresis who have already deteriorated to a more or less extent, and are for the most part confined to the asylums. In well selected pre-paretic or asymptomatic cases showing the paretic formula, I believe malaria would show a very marked decrease in mortality. For those cases in which malaria is objected to on account of high blood-pressure, vascular conditions, kidney trouble, etc., typhoid vaccine would be a better choice of treatment.

Dr. A. N. Collins (Duluth) reported the following case:

The case I wish to present is rare in my experience. This man first came under the observation of Dr. S. H. Boyer, who referred the patient to me for surgical treatment. The man was forty years of age and of Swedish descent. He complained of

1. Loss of appetite.
2. Pain in the pit of the stomach, at first right after taking food and later constant.
3. Vomiting, which he stated came with the pain or soon after the pain started.
4. Loss of weight—about 15 pounds.
5. Weakness.

The stomach content (33 c.c.) contained a small amount of mucus and much undigested material; free HCl, 0; total acid 8.20. At the second examination it was about the same. On January 22, 18 hours after taking food, only about 5 c.c. were recovered, which consisted of gelatinous food particles. His weight on January 16th was 116 pounds; on January 21st was 121 pounds. X-ray examination showed 6-hour residue and 20 hours afterward there was still some barium in the stomach; the bulk of the meal was in the large intestine and the tail of the meal in the transverse colon.

The condition was regarded as early cancerous obstruction of the pylorus and was referred to me for exploration. A note was made by the clinician that early cancer of the pylorus was probable.

On exploration I found a tumor which was not nodular. I called the attention of my assistant to the fact that one could press the finger down into what appeared to be a depression. It seemed that instead of cancer we had a deep indurated ulcer. There were several glands near the pylorus which were round and not nodular or hard. There was no nodular involvement of the liver. There was a shower of stippling over the pyloric area. I did a resection by the posterior Polya method. The pathologist reported that there was an abscess in the wall. This specimen shows a cavity which is a submucous abscess; it contained about one-half dram of pus. (Specimen shown.)

DISCUSSION

Dr. Arnold Schwyzer: This is an unusual case. I have never seen one in my own work, but in the literature up to a few years ago I know there were some over two hundred cases on record. The abscess is between the submucosa and the muscularis and may go somewhat into the layers of the muscular coat. Most of the cases, however, which I have in my memory were treated by drainage and walling off. That a resection could be done in Dr. Collins' case was quite a fortunate thing. There were a good number of deaths after draining operations. Resection, when it can be done cleanly, in other words, when the process is not too far spread, is surely preferable.

Dr. A. E. Benjamin (Minneapolis): I would like to ask Dr. Collins if microscopic examinations were made to see if a diverticulum is present. It is possible to have a diverticulum from the stomach and then an infection and abscess, the opening having closed up.

Dr. Collins: There was no malignancy and it does not penetrate the wall exteriorly. There was only a slight suggestion of a peptic ulcer of the mucosa about ⅛ of an inch in diameter which is not open at the present time. It is possible that there was a small peptic ulcer as the original cause, and that it healed over superficially.

Dr. Arnold Schwyzer: I think in the literature hardly any case is known to have been due to diverticula. It was always thought that the condition was due to either a hematogenous infection or perhaps in some cases to a small puncturing trauma.

Dr. Arnold Schwyzer (St. Paul) reported the following case:

About a month ago I was asked to see a case with another surgeon—a large tumor of the abdomen which had the contour and relations to the cervix of a fibroid. The patient was a young woman twenty-two years of age. She claimed she had menstruated regularly and that the tumor would at times be very large and then again would practically disappear. When I examined her this tumor reached to the middle between the symphysis and filled the upper part of the pelvis tightly. The cervix was hard and virginal. The supravaginal portion of the cervix ran far backward and upward. From the cervix one could feel a gradual and unbroken transition to the tumor. This was felt as well on both sides as in front. But the tumor fluctuated, perhaps somewhat tensely, but definitely. Could it be perhaps a cystic tumor of the ovary which was plastered onto the corpus uteri by some inflammatory process? There was no trace of pain. Could it be a cystic tumor of the corpus uteri, a cystic degeneration of a fibroid? A hydro- or hemato-metra was excluded by the regular menstruation which was not to be questioned.

I was absent when the operation was performed, but the two surgeons who operated found a very perplexing and disquieting condition which appeared to be pregnancy. The tumor was the uterus; it was soft and fluctuating, of a bluish hue, and the adnexa started off symmetrically on either side. When a carefully inserted needle yielded clear fluid, the diagnosis seemed to be definitely forbidding an aggressive procedure and the abdomen was closed. "Primum non nocere" is a valuable principle. No particular harm was done and no bridges were burnt. But a lingering doubt had remained in the surgeon's mind, I am sure, for when on my return I definitely rejected the diagnosis of pregnancy, he readily assented to the proposition to re-operate and to enucleate the tumor, which must be a hydropically degenerated fibroid. While the uterus was the size of the five months' pregnancy, the external genitalia were entirely normal, the cervix small, hard and virginal. The change in size of the tumor was so far unexplainable. Was it an error of observation on the part of the patient? Inquiry in the laboratory as to the amount of albumin found in the withdrawn fluid showed that a large amount of albumin had been noticed. Amniotic fluid contains only an insignificant trace—hardly any. Thus the diagnosis "hydropic degeneration of a fibroid" was confirmed.

This morning we re-operated. The tumor was about the size it had been judged to be at my first examination, but both surgeons who had performed the first operation at once declared that at the first operation the tumor had reached much farther up. It was plainly fluctuating. The color was normal for a fibroid uterus; there was no bluish hue. We shall try to explain this difference later. The adnexa left the uterus on each side at the same level, but this level was too low for a pregnant uterus. The tubes emerged at the junction of lower and middle thirds, and abnormally far in front. The fibroid was therefore in the upper posterior wall of the uterus, though the whole was apparently a uniformly enlarged womb. In this area also the fluctuation was the most outspoken. All this became only definitely clear after the mass had been delivered from the pelvis, which was, however, not a simple matter. The tumor was partly in the pelvis and filled it so completely that it was impossible to insert the fingers far enough into the pelvis to bring the tumor up. With the help of probangs on both adnexa it was gradually worked out of the small pelvis. The fluctuation made us avoid toothed Museux forceps or a corkscrew tractor. After bringing the uterus into the wound a transverse incision was made over the upper posterior surface and the fibroid was shelled out. Twice during this process the finger slipped into a cavity and clear fluid escaped. After the enucleation was completed the mass was still about the size of a grapefruit. It was a practically necrotic and very hydropic intramural fibroid with large irregular cavities of disintegration. From the torn area the inner parts of the tumor bulged out as a flabby, white, bloodless and exceedingly soft material.

What had puzzled the surgeons before was the fact that the tumor, according to the definite statement of the patient, had become very large and prominent and then again had practically disappeared. On the two occasions when I had seen her, the tumor was about the same size. At the operation this morning it struck me that possibly or rather very probably this difference was to be explained by a change of the position of the mass. When the bladder and the ampulla recti were perhaps abnormally full, the tumor was forced up into the large pelvis and on account of its size would stay there. It then bulged greatly. When these viscera were empty the abdominal pressure could sometimes, under unfavorable conditions, push it back into the small pelvis and thus the tumor seemed to have disappeared almost completely. The snugness with which it fitted into the pelvis rim made this explanation probable. The fibroid fitted like a cork in a bottle. This snugness in fitting into the pelvic rim seems to me also to explain possibly the difference (as emphatically stated) in the appearance of the color of the uterus at the two operations, inasmuch as perhaps the marked stretching of the uterine vessels when the tumor was high in the abdomen would cause some degree of cyanosis.

The drawback of having to undergo two operations was compensated by having the pelvic organs preserved intact. Not removing any of the exuberant musculature of the tumor bed and broadly uniting the surface with four layers of continuous suture left a somewhat unsightly shape for the uterus, but gave us good assurance against rupture in a possible future pregnancy. Furthermore, this deformity, due to the bulky capsule of the tumor, will in all probability correct itself gradually, and at any rate has no importance. The uterine cavity had not been entered.

DISCUSSION

Dr. W. H. Condit (Minneapolis): The history of Dr. Schwyzer's report of a patient is of unusual interest to me because it almost parallels a patient I operated upon at the University Hospital several years ago, the exception being that this patient's tumor was the size of a full term pregnancy.

It was at the time when Dr. Beebe was with us, and he happened to be in the operating room at the time. After opening the abdomen and exposing the tumor, his remark was, "Young man, I have seen better men than you obliged to leave the state for taking out a uterus like that." The serosa was bluish and injected. There was fluid underneath, and was a picture of a full term pregnant uterus. On palpation one could almost feel elbows, knees and even the head.

I ruled out pregnancy practically the same way Dr. Schwyzer made his diagnosis in his case—that is by palpating the cervix from the abdominal cavity, finding a firm, hard, contracted cervix, a condition impossible in pregnancy, especially full term.

The tumor was removed. On opening, a large amount of fluid was evacuated out of a thin-walled cavity. On further incision of the tumor, another cavity with fluid was found. In the wall of this cavity were several hard myomata, which were the "elbows" and "knees" supposedly felt. On further resection, a large, hard myoma the size of an infant's head was found.

This patient was much older than Dr. Schwyzer's patient, one point which assisted in ruling out pregnancy, although she was not absolutely beyond the age of conception.

Dr. C. B. Wright (Minneapolis) reported the following case of Undulant Fever:

The patient was a male, aged 47, single. His mother was living and well; father died of Bright's disease; and one brother and one sister were living and well. He had been in the dairy business since he was a boy, except from 1912 to 1919, when he was in the elevator business.

He had always been a fleshy man. In 1908 he first had rheumatic fever and then had it every year for 5 years. The attacks lasted about 5 weeks. Temperature would go up to 103°. He would be lame and could not walk for a long time after attacks and his feet pained a great deal. In 1920 he had an attack of severe pain in his back and right side which the doctor said was due to liver trouble.

He was first seen early in 1927. He was having a lot of dull aching pain in his left ear, took cold easily, and had a raw throat and used to have a lot of phlegm back of his tongue. He stated that he had never had pneumonia nor pleurisy nor typhoid. He complained of more or less indefinite trouble with his stomach; vomited easily in the presence of bad odors or if he sees something unpleasant. The most he ever weighed was 245 pounds, and his weight varied from 220 to 200 for the last four or five years. The last four years he had a tendency to drowsiness and could go to sleep anywhere. He said he was a small eater, but ate everything. His blood pressure had varied from 143/75 to 110/70. He chewed tobacco and smoked, but used no liquor.

On examination the patient was found to be rather fleshy, with pendulous abdomen. The reflexes were normal; no tremor, no eye signs. The throat and teeth were normal. The neck was large, with slight enlargement of the thyroid. Lungs and heart were normal. Liver and spleen were not palpable. The rectal examination was negative.

On July 5, 1927, he came back, having an attack of pain in the right side under his ribs; also some pain on the left side. He was dizzy, feverish and nauseated. He had never been jaundiced, and had no diarrhea. He was tender over the gallbladder area but there was no tenderness over the back. The upper right rectus muscle was somewhat rigid. This attack lasted only a short time. He also complained of numbness in his fingers and said that at times his feet had swelled.

On July 27, 1930, he was seen by Dr. Adam Smith during my absence from the city, when he complained of severe pain in the left hip radiating almost to the knee. Dr. Smith felt it was neuritis. He also complained of back pains.

On February 6, 1931, he came in again complaining of general bad feelings, no pep, drowsiness, stating that he thought he had been feverish for some time. In fact, he had been taking his temperature for two or three weeks and found he had some fever every day. On examination his temperature was found to be 101°. The throat was not inflamed and there was no evidence of a cold. The lungs and heart were negative. There was no rash, no glandular enlargement, and no edema. Abdominal examination was negative. The blood Wassermann was negative.

There being no obvious reason for the fever, I had some blood sent to the University and the report came back positive agglutination in a dilution of 1:320 for bacillus abortus. Typhoid and paratyphoid were negative.

He came back on February 10, 1931. His temperature was 100.4° about 4 P. M. Blood count—Hb. 86 per cent; r.b.c. 4,140,000; w.b.c. 8,050. Differential: polys. 44 per cent; lympho. 53 per cent; monocytes 1 per cent; basophiles 2 per cent; eosin. 0.

On going back over his records, he says that in 1900 he took care of a herd of fifty cows and that about one-third of the herd aborted. In 1901 they raised only three calves from the fifty. During the last four years there had been abortion every year in his herd. Last winter there were 2 abortions in 5 cows. The herd was tested for tuberculosis but not for undulant fever. He thinks he has had the infection for at least four years, and has had the same trouble at intervals since he was a boy. He also claims that the man working with him on the farm complains of the same symptoms. Because of the continuous contact with cows, it is difficult to say how long this disease has been present. Another interesting feature of this case is the history of attacks of inflammation which suggests gallbladder disease.

Dr. Reuben Johnson recently reported, at the Abbott Hospital Staff meeting, a case where no agglutination was found but the organism was isolated from the urine and definitely proven to be B. abortus. He also reported that Dr. Amoss, of Duke University, who had a case of undulant fever with gallbladder trouble operated upon and found the bacillus in the gallbladder. The organism has also been isolated in stools. Cases have been reported where agglutination never was present and the only way to make a definite diagnosis was by isolation from the stools or urine. In Oxford Medicine there is a very excellent account of this disease, with a bibliography down to July, 1930.

DISCUSSION

DR. HAMMES: What is the treatment of this condition?

DR. COLLINS: I would like to ask two questions: first, how does this organism affect experimental animals; and, second, what is the mode of transmission —in the secretions, food, or what?

DR. WRIGHT: There apparently is no particular treatment for this mild type of infection. Gradually it burns itself out in varying lengths of time. The length of time an individual may harbor this infection is not definitely known. Cases have been reported lasting as long as four years.

In reply to Dr. Collins, if this organism is injected it produces a bacteremia. This undoubtedly also happens if animals are fed infected material. The mode of transmission in animals is generally thought to be through swallowing infected material. It may be directly transmitted from one animal to another through the blood stream. This, of course, does not happen to any extent. Workers in slaughter houses have been directly infected through abrasions. The mode of infection in this part of the country, in human beings, is considered to be by mouth and largely through the drinking of milk.

The meeting adjourned.

R. T. LaVake, M.D.,
Secretary.

THERAPEUTIC POSSIBILITIES OF GASTRIC MUCIN

The gastric mucus aids in protecting the cells from digestive or "erosive" damage by the acid that is poured into the lumen of the stomach when the gastric glands are active. Undue secretion of mucus in the stomach is responsible for lowering of the gastric acidity, just as proteins tend to "bind" free hydrochloric acid. The actual capacity of mucus to produce such an effect has been verified. Mucin prepared from hogs' stomachs was more potent than equivalent amounts of common protein foods such as gelatin, meat and egg white. In a few human patients with definite histories of ulcer and roentgenographic evidence of peptic ulcer the addition of powdered mucin to the ordinary bland diet brought about relief from subjective symptoms. (Jour. A. M. A., February 28, 1931, p. 693.)

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of February 5, 1931

The Annual Banquet of the Minneapolis Surgical Society was held at the Nicollet Hotel on the evening of February 5. The President, Dr. A. T. Mann, presided and introduced the guest of honor and speaker, Dr. Clay Ray Murray, Associate Professor of Surgery at Columbia University. The title of Dr. Murray's address was "Delay and Non-union of Fractures." There were 36 members and 44 guests present.

During Dr. Murray's visit in the city he gave a talk before the Hennepin County Medical Society on "The Proper Use of Physiotherapy in the Treatment of Fractures," and also presented his "talkie" on "The Treatment of Angle Fractures."

On Thursday morning Dr. Murray conducted a Clinic on Fractures at the General Hospital, which was of unusual importance in view of the fact that Dr. Murray discussed the actual treatment of the cases at hand. On Thursday afternoon he addressed the medical students of the University in the Anatomy Amphitheater, speaking on the "Modern Conception of Bone Formation in the Adult and its Bearing on the Clinical Treatment of Fractures." These meetings were open to the general profession, and were unusually well attended, and the talks received with much enthusiasm.

The formal banquet meeting at the Nicollet Hotel was for the members of the Surgical Society and their invited guests. In addition to the paper, Dr. Murray told of their work, both experimental and clinical, at the Presbyterian Hospital in New York City, and, in closing, extended a cordial invitation to any of the physicians who came to or near New York City to come to the hospital and observe the work that is being done there.

H. O. McPheeters, M.D., *Secretary.*

PARIOGEN TABLETS

There has grown up, during the past four or five years, a huge business in the sale of antiseptics and germicides, real or alleged, that are frankly purchased, if not obviously sold, for contraceptive purposes. The term contraceptive is not used in the advertisements; "feminine hygiene" takes its place. "Pariogen Tablets," marketed by American Drug and Chemical Company, of Minneapolis, have been advertised as the "new mode of personal hygiene." An advertisement stated "Pariogen Tablets may be carried anywhere in a purse, making hygenic measures possible almost anywhere, no other accessories or water being required." The advertising has stressed that the tablets are non-poisonous, but do not declare the composition of the tablets. Some six years ago a reading notice appeared in a medical journal from which it appears that the tablets are essentially tablets of chloramine, U.S.P. By selling these under a proprietary name as a nostrum of essentially secret composition, the company is able to get a price that is out of all proportion to the value of its product. (Jour. A. M. A., February 7, 1931, p. 458.)

PROCEEDINGS OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of January 8, 1931

The regular monthly meeting of the Minneapolis Clinical Club was held in the lounge of the Hennepin County Medical Society on Thursday evening, January 8, 1931. The meeting was called to order at 7 o'clock by the President, Dr. Moses Barron. There were 25 members and one visitor present.

Minutes of the December meeting were read and approved.

The President called the attention of the members to the new magazine rack in the Library room which had been presented by the Clinical Club to the Hennepin County Medical Society.

The scientific program was as follows:

Dr. Walter E. Camp reported two cases of Melanotic Tumors of the Eye.

I wish to present two cases of intraocular malignant melanomata in which rather complete pathological examinations were made.

(a) The first case is that of a married woman, aged 54 years, who came for examination because of intermittent redness and pain in her right eye which had been blind for some years. There was no history of injury or serious illness. Examination showed conjunctival and ciliary injection; the anterior chamber was completely obliterated; the iris was atrophic and pushed forward against the cornea. The pupil was eccentric, irregular and fixed. The lens was cataractous, preventing examination of the fundus. The eyeball was stony hard, and tension with the tonometer was 60 mm. Hg. as compared to 20 mm. Hg. in the left eye. There was no light perception present. Transillumination of the globe showed the outer half to be opaque.

The general physical examination showed numerous small, hard, bluish, subcutaneous tumors on the scalp, chest, abdomen, axillæ and groins. The liver was not enlarged. There was no weight loss, and no cough. The patient stated that the subcutaneous nodules came about two months previous to the time of examination.

A diagnosis of malignant intraocular melanoma was made, and enucleation done. A biopsy also was made from one of the subcutaneous tumors.

The eyeball on section showed a large melanotic tumor involving about three-fourths of the choroid and extending into the ciliary body. Perforation through the sclera had occurred at the equator along the vortex veins. Parts of the tumor were deeply pigmented; others necrotic and showing cholesterin crystals.

There was no local recurrence of the tumor after enucleation, but the metastatic tumors increased in size and the liver became enlarged. Death occurred fifteen months after enucleation. Autopsy showed generalized melanomatosis of all organs and visceral surfaces.

(b) The second case is one that I saw some years ago with Dr. Murray at the University Hospital. The patient was a young farmer nineteen years old who came complaining of loss of vision in the left eye. His parents noticed a change of color in the iris of this eye almost two years before coming to the hospital.

Examination showed a mild conjunctival and ciliary injection. The pupil was dilated, the anterior chamber shallow. The iris showed areas of deep pigmentation scattered from the periphery to the pupillary margin. These areas were not raised above the surface. The lens was clear. The fundus showed glaucomatous cupping of the optic disc and optic atrophy.

Enucleation was done and the whole eyeball sectioned serially. Microscopically the entire circumference of the iris was found to be infiltrated with a diffusely pigmented tumor. Graphic reconstruction showed the tumor as outlined in the slide. (Slide shown.) The tumor was composed of round and spindle cells, many of which were deeply pigmented. The tumor cells were most numerous at the periphery of the iris, and extended into the ciliary body and onto the posterior surface of the cornea. Some of the tumor cells were found extending out along the anterior ciliary veins. Aside from the glaucomatous cupping of the disc and optic nerve atrophy, the remainder of the eyeball was normal.

Annular malignant melanoma of the iris or ciliary body is exceedingly rare. They are slow growing and may give late visceral metastases similar to choroidal melanomata.

DISCUSSION

Dr. Erling Hansen: These two cases are very interesting and demonstrate, at least to some extent, the difficulty one finds in making a diagnosis. In the first case if it had not been for the fact that metastases were found throughout the skin in places where nodules could be taken out and sectioned, the diagnosis would have been rather difficult. The fact that the lens in many of these becomes sclerosed and cataractous makes it difficult or impossible to see the fundus, so that the presence of tumors cannot be diagnosed.

In the old division in stages of development of tumors, particularly tumors of the choroid of which we have the greater number in the sarcomatous group, the first stage—the quiescent development of the tumor—was missed as the patient is seldom seen in this stage. Most patients come to the oculist because of some disturbance of vision or pain, and unless the tumor is in the macular area there is very little early disturbance of vision. Then the tension in the eyeball increases and brings on the second stage, in which probably most of the patients are seen. The third stage is the breaking down of the tumor; and the fourth stage, the invasion of other tissues.

Unfortunately, one of the sad things about these tumors is that they metastasize very early, especially in the liver, and even though the eye is enucleated at a very early stage, the metastasis has already taken place.

Another thing causing difficulty in diagnosis is in extensive detachment of the retina. The evidence of a solid tumor behind the retina is suspected and it can often be demonstrated in the anterior half of the eye by transillumination through the sclera. If the tumor mass is more posteriorly situated we have more difficulty.

I was particularly glad to see the reconstructed section of this annular tumor, which is rather a rare condition.

Dr. Kenneth Phelps: There is only one thing I might add, and that is in my experience I have known of only one patient who had his eye enucleated for a melanoma and did not have a metastasis. The operation was done about 30 years ago and the patient still lives.

Dr. Moses Barron: I would like to ask Dr. Camp why the eye was enucleated in the first case after there were obvious metastases throughout the body?

Dr. Camp: That was done for the relief of pain and also to confirm the diagnosis. I might add that the last case, the one I saw with Dr. Murray, was reported in full by him in the *American Journal of Ophthalmology.*

Dr. J. S. McCartney: The whole subject of melanoma is a very interesting field in tumor diagnosis because of the great variety of histologic pictures one may see in connection with these tumors, whether they are in the eye, or skin, or intestinal tract. One can get almost any sort of a microscopic appearance and if one reviews a series of these he sees why there is so much disagreement in the naming of a melanoma; why one person wants to call them melanosarcoma and another melanocarcinoma. You may see everything from a spindle cell to round cell, or alveolar sarcoma, and even to things that you want to call carcinoma. Occasionally you see one which you want to call giant-cell sarcoma. I saw such a one not very long ago which was in the small intestine as a primary tumor about 10 or 12 inches from the ileocecal valve. It was 10 by 2 cm. and ulcerated but not an annular tumor and, in spite of its size, did not produce obstruction. The patient was operated for appendicitis, which she had.

Several years ago a patient came to the University Hospital with an enlarged liver. There were several diagnoses made in the hospital and when she died the enlarged liver was found to be the site of metastatic melanoma. Then they got to looking around and found that she had had an eye removed. In looking up her history it was found that she had been in the hospital about five years before when the eye was removed for malignant melanoma.

Another case I recall, which was reported by Dr. Morrison, of a patient at the General Hospital considered as some functional neurosis. It was found that she had a melanoma in the brain and another in the small intestine and they could not determine which was the primary tumor.

Dr. Barron: The case which Dr. McCartney mentions was very interesting. I remember it very well because I was house officer at the hospital at that time. A number of different diagnoses were made on the case. At autopsy an enormous liver was found containing large black tumors. It was then decided to look up the original record of the enucleated eye which had been removed by Dr. Todd about six years previous. This was found to contain melanosarcoma.

Dr. H. L. Ulrich: They have learned a lesson over at the hospital now. They have had one similar case since in which the condition was diagnosed.

Dr. T. A. Peppard read a case report for Differential Diagnosis: Hemoptysis with Gradual Development of Pulmonary Lesions.

The patient was a female, aged forty-one, office worker, who was first seen in September, 1930. Her complaints at that time related entirely to the gastrointestinal tract. She stated that she had had a "summer cold" for three months during the past summer, expectorating some mucous material in the morning. She had never expectorated any blood. She became slightly dyspneic when excited. She complained of some transient pains over the anterior chest.

Her family history is quite unimportant. There was no exposure to tuberculosis at any time. She stated she had had tonsillitis and had been observed by a rhinologist who had suspected the possibility of some sinus trouble.

The patient was well-developed, and moderately well-nourished, although thirteen pounds under her best previous weight. Pulse rate was between 80 and 90; temperature between 99° and 100°. There were some crowned and filled teeth noted, although her dentist reported that all the teeth were vital. The tonsils are not greatly enlarged, but, because of the previous history of tonsillitis and also because of the presence of a number of cervical slightly enlarged lymph nodes, I considered that the tonsils might be a focus of infection. The thyroid was normal in size. The heart was quite normal; blood pressure 110/80. There were no physical signs indicative of lung disease. There was no enlargement of any of the abdominal organs, although the patient was diffusely tender to palpation over the abdomen. No pelvic disease or abnormality was found.

Examinations of blood, urine, stools, and stomach contents were quite normal. Roentgen examination of the gastrointestinal tract showed no evidence of any organic disease. The skin tuberculin test was definitely positive, and stereoscopic plates of the chest showed only calcified lymph nodes at the left hilum. There was no eviednce of tuberculosis or other parenchymal pathology.

On November 13, without other symptoms, the patient expectorated about one tablespoonful of blood, and from that time until the present (January 8, 1931) she has raised some material containing some amounts of blood almost daily. Since then numerous specimens of sputum have been examined. These all have been small in amount, the 24-hour quantity not being over 30 c.c. at any time. The sputum has consisted of grayish, greenish purulent material, mixed with red blood in streaks, and with some clots. No tubercle bacilli have been found at any time, but there have been many other organisms—staphylococci, diplococci, and streptococci. There was no characteristic odor to the sputum.

Physical examination November 20th showed a slight impairment of resonance over the lower half of the left chest posteriorly, with a slight change in breath tones, they being broncho-vesicular in character. Stereoscopic X-ray films were made on this date. Calcified glands in the region of the left hilum were again shown as before. There was no evidence of parenchymal pathology in the upper portions of either lung. There was slight circumscribed density in the lower left lobe.

For a month's time the patient continued to have sputum with blood, as mentioned before, but for the past three weeks the purulent character has disappeared. The physical signs in the lower left chest have cleared up. The patient has gained nine pounds in weight, and feels quite well.

The X-ray examination of the chest was repeated January 3rd, 1931, and these plates show now a definite resolution of the localized infiltration, previously shown. In the opinion of the roentgenologist there is no evidence of tuberculosis.

I do not believe that this patient has pulmonary tuberculosis. There is no evidence at this time that she has a primary new growth of the lung. I have thought of the condition as being one of those non-specific pulmonary infections similar to those described under various titles by Reisman, Miller, Hamman, and Wolman. I have had several cases similar to this, but I do not recall any in which there has been hemoptysis, although some of these other observers have recorded this symptom. They are most often associated with, or dependent upon, chronic infections of the upper air passages, particularly the sinuses and tonsils, and in the present case I have advised that the patient have a tonsillectomy.

DISCUSSION

Dr. F. W. Wittich: I would like to ask Dr. Peppard more in detail about the sputum. Aside from the X-ray, which is sometimes misleading in these basal lesions, the positive cutaneous test could be followed up with the subcutaneous test, starting with ½ mg. of tuberculin, to see how much of a constitutional reaction resulted, and if allergic to comparatively small doses. Then I think a 24-hour specimen of the sputum would have given us leading information. Pottenger has long ago pointed out the sediment volume determination and albumin content of the sputum as being valuable in differentiating pulmonary tuberculosis from simple catarrhal and non-tuberculous abscess.

Dr. Peppard: All of the specimens that I received had blood in them. The quantity was not large at any time. I should estimate that she probably did not raise at any time over a tablespoonful in 24 hours.

Dr. Wittich: Even so, I think that searching carefully for elastic fibers might give us some information. In their absence, of course, I would feel there was less chance of pulmonary suppuration. The fact that the apices are entirely clear and that the lesion is basal is evidence against a tuberculous lesion, although there is some evidence of childhood tuberculosis on the left side as shown by the calcified hilus nodule. I think perhaps one would consider malignancy until he had seen the X-ray. It certainly is a favorite site for primary carcinoma, but the shadow does not have that appearance and the patient is gaining in weight. Then there is a group of cases that we are seeing right now with ordinary colds, with infected tonsils, sinuses, or some other focus of infection where there is a patch of lower lobe consolidation with or without bloody sputum. There are at times small areas over which a shower of very fine crepitant râles are heard and may persist for weeks. Occasionally there develops in these areas of unresolved bronchopneumonia a small abscess which clears up in six to eight weeks, showing no more of a shadow than this and subsequently clearing up entirely.

The evidence presented, I think, points toward a small abscess which is resolving and one arising from some other source. I would diagnose this case of Dr. Peppard's as non-tuberculous, inflammatory in character, resulting in a small pulmonary suppuration, probably metastatic; and if it does not clear up in a reasonable length of time one might suspect malignancy.

Dr. H. L. Ulrich: I think Dr. Wittich has covered the field very well. I might suggest a localized bronchiectasis, but that is the only thing which I could add to this discussion.

Dr. R. G. Allison: I have not seen these plates before, and do not think there is much difference in the three; if so, the one of November possibly shows a little more of the inflammatory condition. Clinically it might be a bronchopneumonia, but from the history I think she has a small abscess there. Certainly there is nothing to suggest a primary new growth. It would be unusual for it to be tuberculosis. I think one can rule out bronchiectasis, tuberculosis and tumor.

I think most likely it is a metastatic abscess which may flare up again but which in the end will probably undergo complete resolution.

Dr. J. C. Michael gave a lantern slide talk on "Schematic Orientation for Pathogenesis, Localization and Classification in Neuro-Psychiatry."

DISCUSSION

Dr. H. B. Hannah: As far as the classification is concerned, this was very well done by Dr. Michael. There is one thing I might add and that is I am always hoping the time will come when we shall know more about the physiology involved in this question and not so much about descriptive psychiatry.

The meeting adjourned.

H. Bright Dornblaser, M.D.,
Secretary.

LIMITATIONS OF BACTERIOPHAGE THERAPY

Recent investigations suggest that future therapy with bacteriophage preparations must be limited to certain definite anatomic types of infection. The deductions drawn are that no therapeutic effects whatever are predictable for bacteriophage except under conditions in which local extrabacterial bacteriophage concentration can be raised and maintained. From this it appears that bacteriophage therapy would be a predictable disappointment in erysipelas, furunculosis, pneumonia, pyelitis, cellutis and bacteremia, and in cystitis except by concentrated irrigation. The use of this therapy would thus be limited to such closed organs as the intestine and to well encapsulated pus cavities. (Jour. A. M. A., February 28, 1931, p. 693.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg.
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

THE OPERATIVE TREATMENT OF GLAUCOMA: Professor Doctor Emil de Grosz, Budapest, 1930. (Note: This article came as a pamphlet and has not been published, to the reviewer's knowledge, in a periodical.)

VON GRAEFE TERMINOLOGY

I. Inflammatory (congestive glaucoma
    a. prodromal stage
    b. acute
    c. chronic
    d. absolute
    e. stage of degeneration
II. Simple glaucoma
III. Juvenile glaucoma

In simple glaucoma the leading signs are missing or inconspicuous. Correct diagnosis can only be made by objective findings such as excavation of the optic disc and shrinking of the visual fields. The degree of recovery depends essentially on the length of time the eye has already been affected.

In the Budapest clinic the frequence of the different types was as follows: chronic congestive eyes 70 per cent, cases in the prodromal or acute stage 20 per cent, simple glaucoma about 10 per cent, and the juvenile type less than 1 per cent.

In the types of operative procedure used iridectomy has kept its important role, while trephining was employed in numerous cases at the beginning and cyclodialysis more frequently at the end of the period. With the trephine procedure favorable results were obtained in 83 per cent of the chronic congestive cases but in the absolute cases the results were much poorer. The incidence of late infection can be markedly reduced if the fistula is carefully covered with a flap.

In the cases in which cyclodialysis was used the tension was decreased in 78 per cent of the chronic congestive type. The results proved to be better with simple glaucoma but less favorable with absolute. Cyclodialysis has the advantage of low operative risk and may be repeated two to four times. If it is a failure it may be followed by trephining.

In cases of simple glaucoma sclero-iridectomies were usually performed, with favorable results due to reduced tension in 94 per cent; the eyesight remained unchanged in 92 per cent, became better in 5 per cent and worse in 3 per cent. The favorable results decreased to 76 per cent in the years following. These percentages were obtained only in those cases in which the tension was successfully reduced by pilocarpine.

Anterior sclerotomy was performed in the juvenile type and in those cases in which cataract extraction had been done through an iridectomy.

In conclusion, surgical intervention, supported by frequent use of pilocarpine, is so far the most effective means of relief for glaucoma. With regard to the adequacy of operations performed on different kinds of glaucoma, the following principles are observed at the Budapest University Eye Clinic:

Inflammatory glaucoma, prodromal and acute—iridectomy (Graefe)
Inflammatory glaucoma, chronic—cyclodialysis (Heine)
Glaucoma, simple—iridosclerotomy (Lagrange)
Glaucoma, juvenile—anterior sclerotomy (Wecker)
Glaucoma, stage of degeneration—enucleation (Arlt)

L. G. Flanagan.

MEDICINE

TUBERCULOSIS ABSTRACTS*

Adolescence is a period of strain. Youngsters who have, during the earlier years of childhood, been massively infected with tubercle bacilli are likely during the teen age period to develop the adult type of tuberculosis. It is during high school years that the destiny of many of these children is decided. This is reflected in the steep rise in the death rate curve during the late teens and early twenties. Walter L. Rathbun has, since 1923, made a systematic search for early tuberculosis, regardless of symptoms, by means of the tuberculin test and the X-ray. He has recently completed the task of examining practically every high school pupil in Chautauqua County, New York; namely, 7,171 children. His experiences are recorded in a special publication, from which these abstracts are derived.

Tuberculosis Among High School Students

Examinations of school children for early tuberculosis began in Chautauqua County, New York, in 1923 by sending to local clinic centers (a) pupils physically below par, (b) those who had symptoms referable to tuberculosis and (c) those who have been exposed to the disease. The results of the first year's effort were enlightening, but since facilities were limited, it was decided the next year to examine only the high school groups because these children leave school first. Each high school student was given a chest examinaiton without reference to family history, height-weight ratio, or symptoms. The results justified the procedure as many cases of tuberculosis were found among those in whom it was least suspected and who were apparently perfectly healthy.

Of the students so examined, three groups were then X-rayed; (a) those with suggestive signs of pulmonary tuberculosis; (b) those in actual contact with a case of tuberculosis; (c) those with a history of previous or present symptoms referable to tuberculosis. All such children were transported to Newton Memorial Hospital, where they were X-rayed. This procedure continued during 1924 and 1925, when the plan was broadened by carrying the diagnostic work directly into the schools.

EXAMINATIONS MADE IN SCHOOLS

The Chautauqua County Tuberculosis Association furnished funds to purchase a portable apparatus and X-ray films which made it possible to do the work in the school buildings. Incidentally, while it is true that the portable X-ray machine has its shortcomings, it is capable when properly handled of revealing lesions of the childhood and the adult type. The few cases in which more detail is needed may be X-rayed with a high-powered machine. The utility of the portable apparatus is a distinct advantage, and having the examinations made in the school arouses interest among school people. Stereoscopic sets of pictures were made routinely.

In 1926, the mode of procedure was again modified. Students were taken from the study halls and X-rayed, and only those with definite or suspicious signs were given a physical examination. This speeded up the work and also increased the percentage of positive cases. The tuberculin test was not insisted upon as a routine measure at that time because public opinion was not favorable to its use, whereas X-ray examinations were heartily approved.

In 1927, the intracutaneous tuberculin test was introduced as the first procedure in diagnosis. A specially trained nurse made the test and read the reaction, thus saving valuable time of the physiican. It was neces-

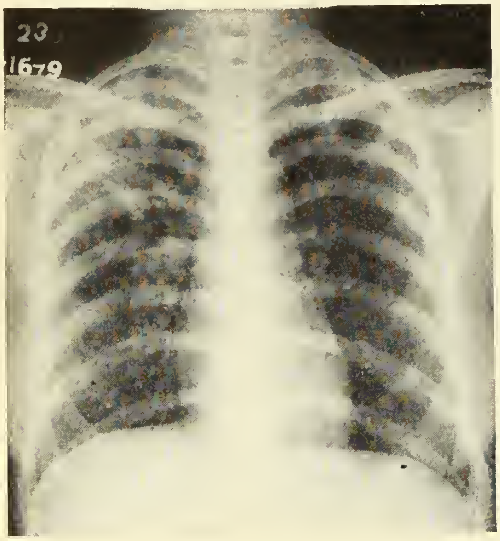
---

*Reprinted from *Tuberculosis Abstracts*, a review for physicians, issued monthly by the National Tuberculosis Association, April, 1931, Vol. IV, No. 4.

sary to secure the consent of parents to make the test; hence, the percentage tested was reduced to about 50 per cent. Positive reactors only were X-rayed.

INTIMATE CONTACT IMPORTANT FACTOR

These studies indicated that tuberculous disease of the lungs and tracheobronchial lymph nodes results from prolonged and intimate, rather than casual, exposure to tubercle bacilli. Intimate exposure most commonly takes place in the home. It was found that the percentage of positive reactors was greater among children living in the city of Jamestown (44%) than among similar groups in the villages (25%) but that the incidence of tuberculous disease of the childhood type was about the same in rural and urban areas. Apparently, while casual contact (which is more common in cities) may be the starting point of an infection as revealed by the tuberculin test, it is incapable of causing demonstrable disease in most cases. Intimate contact with a sputum-positive case of pulmonary tuberculosis is the usual cause of the disease. In 54 per cent of the families of tuberculous children, a parent had either died of the disease or had pulmonary tuberculosis at the time. In 17 per cent of the families, there was a parent with suspicious signs of tuberculosis. In some cases, the "spreaders" were older siblings, in one, a nurse-maid, and in another, a boarder.



Mottling in right upper and upper part of lower lobe, cavities in right upper, scattered mottling throughout upper two-thirds of left upper lobe with cavity near apex. Calcified lymph node above sternal end of left third rib, indicating presence of childhood type lesion.

Girl, 15 years old, very active in scholastic, social, and athletic affairs. Denied symptoms until questioned closely. Diagnosis made during routine school X-ray examination.

RESULTS OF STUDY

During the past seven years, 30,000 pupils, 7,171 of whom were of high school age, have been examined, with the following results:

	Number	Per cent
Negative to tuberculin test	570	7.9
Negative on X-ray	5,676	79.2
Children requiring observation	538	7.5
Childhood type tuberculosis	250	3.5
Suspect adult type tuberculosis	50	.7
Adult type tuberculosis	60	.84
Miscellaneous	27	.36
	7,171	100.

Cases of childhood tuberculosis were 15 per cent higher for females than for males, while the morbidity for the adult type was 43 per cent higher among females than among males.

Many of the arrested cases continued school work but were given eight weeks' treatment in a high school health camp located on the grounds of the hospital. During the past two years, a high school has been conducted for students under treatment in the hospital. Local school authorities are well satisfied with the experiment. For ambulatory cases and some bed cases, school work is the most profitable kind of occupational therapy.

PROTECTING THE STUDENTS' HEALTH

The tendency in modern schools is to push the students to the limit of their capacities. Healthy children can stand the pace, but not those who are below par physically. Therefore, those with physical disabilities, real or potential, must be searched for and protected from overwork. Similarly, sports and competitive athletics must be curtailed for the physically handicapped. Rough handling and excitement are heavy drains on the body reserve and frequently precipitate a breakdown. School authorities in Chautauqua County coöperated admirably in protecting those who needed protection.

The public schools are logical centers for the dissemination of medical knowledge about tuberculosis, just as they serve as convenient units for discovering cases. Every student should be examined before graduating and certainly before working papers are granted.

Of course, no child with positive sputum should be allowed to attend school lest he infect his fellows.

"Every available resource than can be spared should be devoted to the public school field, for in the control of tuberculosis our hope of success in the years to come rests largely upon the care of the youths of today."—*Health in High Schools, Walter L. Rathbun, Natl. Tuberc. Assn.*

ALTERNATING PNEUMOTHORAX: I. D. Bronfin, M.D., Denver, Colo. (Nat'l Tuberc. Assn.—Trans. Twenty-Sixth Annual Meeting, Memphis, Tenn., 1931). The principles governing pneumothorax therapy have undergone striking modification during the past ten years. The indications for this form of treatment were at first confined to strictly unilateral cases. Experience has shown that proliferative and even fibrocaseous processes in the good lung, when not too extensive, improve after a satisfactory collapse of the more involved lung. The further observation that a moderate reduction in lung mobility, instead of complete collapse, does not lead to bad results as was at first believed, but on the contrary brings about definite improvement, led some physicians to the rather heroic measure of simultaneous bilateral compression.

A review of the literature on simultaneous bilateral pneumothorax discloses that the encouraging results reported are not entirely conclusive, because of the short period of observation. The work of Kinsella and Mattill convinces one that bilateral pneumothorax is feasible in a certain number of cases and for definite emergencies, but leaves one in doubt as to the efficiency of this treatment. Kerzman reports 19 cases, of which several showed marked clinical improvement, but issues a warning that the procedure is justified only when all other methods have failed. On the other hand, the need for resorting to alternating or successive pneumothorax will continue to increase, because with the increase of the use of pneumothorax in the treatment of cases with bilateral lesions, reactivation of the old lesion or progression of the disease in the untreated lung will not be an uncommon complication. Also a large number of patients with apparently unilateral disease develop contralateral lesions during penumothorax therapy.

Six cases are reported in which alternating pneumothorax was used and the clinical course was observed for from two and one-half to seven years.

Case I. (Example) The indication was an acute contralateral involvement twenty-one months after the first pneumothorax was instituted. The second pneumothorax was maintained for twenty-six months. The lesions on both sides were of the exudative variety and the result was an apparent arrest of the disease.

Conclusion: Many patients who develop contralateral disease during pneumothorax therapy or have bilateral disease equally distributed, can be treated successfully by means of alternating pneumothorax, and in some instances will accomplish a complete arrest of the disease.

E. H. Jorris.

PEDIATRICS

THE THERAPEUTIC USE OF MIXED RESPIRATORY VACCINES: Roy P. Forbes, M.D., Denver, Colo. (Arch. of Ped., January, 1931, Vol. XLVIII, No. 1). The status of vaccine therapy seems to be as dubious and hazy now as it was one or two decades ago.

Davis concurs in the belief that prophylactic immunization against colds is not of value in early childhood. He asserts, however, that the procedure apparently is of value for older children and adults.

It was quickly noted that cases in which cough accompanied the upper respiratory infection were frequently relieved after one to three injections. Where there was clinical evidence of sinusitis, the nasal discharge sometimes at first increased, then subsided.

Vaccine therapy was reserved for those cases which suffered a relapse and had cough as a prominent symptom. It often gave prompt relief to these children. Usually one injection was sufficient to loosen and relieve the dry cough, and in many instances children with severe bronchitis and early broncho-pneumonia made a prompt recovery in 48 hours. However, the other complications, such as adenitis, otitis, and mastoiditis, were apparently unaffected by the vaccine. They found that a total of 211 house calls were necessary for the vaccine-treated cases, as compared with 300 house calls on the control series in 100 cases each. It is of interest to note that no case in the vaccine series developed either bronchitis or pneumonia after treatment was begun, whereas in the control series five children developed pulmonary complications while under careful medical supervision.

The therapeutic value of the vaccine in respiratory infections has not been widely demonstrated, and there are, as yet, comparatively few reports of such usage, but the reports which have been made are generally favorable. The writer's experience leads him to conclusions highly favorable to the use of respiratory vaccine as a therapeutic agent in certain infections of the respiratory tract.

R. N. Andrews, M.D.

ACUTE INTUSSUSCEPTION IN INFANCY: OPERATIVE AND NON-OPERATIVE TREATMENT: David M. Siperstein, M.D., Minneapolis (Arch. of Ped., January, 1931, Vol. XLVIII, No. 1). Intussusception is typically a disease of infancy. It is an acute condition requiring prompt recognition and prompt treatment. It occurs chiefly during the first year of life, especially between the fourth and tenth month.

Koch and Oerum feel that this condition is caused by a preliminary circular contraction of the gut followed by an overlapping. Fraser considers that abnormal and irregular peristaltic rhythms are responsible. He find that, "if the ileocecal segment is provided with a loose mesenteric attachment, the occurrence of a peristaltic rush is likely to be followed by the development of intussusception."

Perrin and Lindsay offer the most logical explanation thus far advanced and accompany it by histological proof. They point out the obvious development of lymphoid tissue at the ileocecal valve and its rapid subsidence during the second year of life. The incidence of intussusception is directly proportionate to the development of the lymphoid tissue in this particular area. This theory explains the characteristic age incidence, and it explains the frequency of the ileocecal type.

Acute intussusception is characterized by four cardinal symptoms: The first of these is abdominal pain; the second, vomiting; the third, blood and mucus in the stool; the fourth, a palpable tumor mass.

A comparison of the mortality statistics with various forms of treatment tends to show that, with proper selection and precautions, mechanical interference gives excellent results.

In the hands of a surgeon skilled in pediatric procedure, disinvagination of an acute intussusception is a relatively simple and safe procedure. In any questionable case, this might be the method of choice. Early diagnosis and prompt treatment should definitely lower the mortality of acute intussusception. The surgical and non-surgical procedures are not competitive methods. They should complement one another under the careful supervision of the trained pediatrician and surgeon.

R. N. Andrews, M.D.

ACUTE PHOSPHORUS POISONING: Eleanor M. Humphreys, B.A., and Bela Halpert, M.D., Chicago (Amer. Jour. of Diseases of Children, Vol. 41, No. 2, February, 1931). The incidence of phosphorus poisoning has decreased greatly in recent years. Undoubtedly the decrease is due mainly to the prohibition of the manufacture and sale of yellow phosphorus matches. In this country there are still two easily available sources of yellow phosphorus: certain brands of rat and roach paste and certain types of fireworks.

In communications to the editor of the Journal of the American Medical Association, Stacy, Busey, and McCornack discussed the case of the fifteen months old son of Dr. Stacy, who ate the unburned remnant of a Devil-on-the-Walk and died four days later. Corwin recorded the death of a three year old girl, forty-six hours after placing a Spit-Devil in her mouth.

The risk of acute phosphorus poisoning has been decreased but not eliminated by the prohibition of the manufacture and sale of yellow phosphorus matches.

The ingestion of fireworks containing phosphorus is a cause of acute phosphorus poisoning in children.

A review of the medical literature reveals a total of twelve reported cases. There is evidence that this figure does not give a true idea of the frequency of phosphorus poisoning caused by fireworks.

The commonly implicated agent is a single type of fireworks, variously known as "Son-of-a-Gun," "Devil-on-the-Walk," and "Spit-Devil."

R. N. Andrews, M.D.

SURGERY

THE MIXED TUMORS OF THE SALIVARY GLANDS. D. H. Patey (The Brit. Jour. of Surg., October, 1930, p. 241). A study of fifty-five cases of mixed tumors of the salivary glands treated at the Middlesex Hospital since 1919.

Based upon the histological appearance of the tumors, a division is made into four types: (1) "typical" tumors, (2) cellular and not well differentiated, (3) cellular but well differentiated, (4) cellular and not well differentiated and cells showing irregularity and nuclear changes. In the first group are cases with relatively few cells, which are small, irregular and deeply staining and with an abundance of myxomatous tissue. In the second group are those in which there is a relative abundance of the cellular element. In the third group the cells are arranged in acini or ducts much like nests of fairly normal glandular tissue. In the fourth group are cases showing malignant tendencies.

The derivation of the tumors is believed to be from epithelial tissue entirely, instead of being mixed epithelial and mesenchymal tissue. The myxomatous portion is believed to be a derivation or product of epithelial cells.

In this series of fifty-five cases, thirty-eight were in the parotid gland, six in the submaxillary gland and five in the palate. Six were in other regions about the face.

Recurrence after operation was present in eleven out of the thirty-eight parotid cases and in other regions the percentage was about the same. One recurrence occurred as late as nineteen years after operation.

The recurrent tumor was encapsulated or infiltrating. There was no evidence of a greater tendency to malignancy in the recurrent cases. The group showing malignant tendencies, *i.e.,* group four, definitely had a higher percentage of recurrences. In the other three groups the recurrences occurred in about equal percentages.

The causes of the recurrences were two: incomplete removal and development of new and independent tumors. The tumors not infrequently showed small daughter tumors on the edge, which could easily be left behind.

The treatment suggested was surgical removal although the more cellular varieties might give good results by treatment with radium.

R. W. Koucky, M.D.

PUSH FLUIDS: G. De Takats, M.D., F.A.C.S., Chicago, Ill. (Amer. Jour. of Surg., No. 1, Vol. XI, January, 1931). Under the above heading, the author treats the subject of the giving of fluids after operation; because of the fear of dehydration, it has become a routine to order fluids to be pushed after operation. While in general this is correct, yet one must individualize the case, and take into consideration the mechanics of water retention and water excretion, and regulate the use of fluids accordingly. It is possible to overload the system, and develop a water intoxication, which in itself is detrimental.

The author reviews the movement of water through the system (1) from the standpoint of cardiac action, (2) from the condition of the kidneys, (3) from the condition of salt retention, and (4) from the pathologic changes in tissues.

Realizing that after an abdominal operation the intestines frequently contain fluid, one does not get sufficient absorption of fluids by rectal drip in many of these cases, and may only aggravate the discomfort of the patient. Therefore, the giving of fluids through the skin, or intravenously, is preferable. Then also the absorption of dextrose per rectum is often very little, which, while harmless in itself, yet may give a false sense of security by the fact that one really is not supplying dextrose to the system; on the other hand, insulin used under such circumstances may cause an insulin toxemia.

To sum up the article, the author calls attention to the water balance as it exists in the individual patient, rather than in the normal person, keeping these facts in mind in applying one's use of fluids. In general one can say that, where an oral intake of fluids after operation is prevented, a satisfactory water balance can be maintained with 3,000, and not more than 4,000, c.c. of fluids. Much of this fluid can be given under the skin in the form of 5 per cent dextrose solution, but in some cases the intravenous drip of 10 per cent dextrose solution is indicated. If the salt balance is disturbed, Ringer's solution under the skin is preferable.

The order to push fluids should not be given unless one checks up the results of this pushing, and maintains the proper physiological balance.

A. E. Sohmer, M.D.

SPONDYLOLISTHESIS: Samuel Kleinberg, M.D., (Amer. Jour. Surg. Vol. X, Dec., 1930, p. 521). The author reports four cases of spondylolisthesis in which the dislocation of the fifth lumbar vertebra was due to congenital deformity of its posterior arch. The most important congenital anomaly in relation to spondylolisthesis is a congenital cleft in the pedicles due to lack of fusion of the superior and inferior articular processes of the fifth lumbar vertebra on one or both sides. This defect is filled in by connective tissue, and the vertebral body and neural arch are held together only by ligaments which may be stretched or torn by trauma. This was the mechanism of the dislocation in two of the author's cases.

An increase in the lumbosacral angle is another factor in the production of spondylolisthesis. Combined with this there may be a change in the shape of the superior margin of the sacrum in which the upper surface is convex and the anterior half slopes downward and forward. This condition tends to initiate subluxation of the last lumbar vertebra during ordinary occupation. Another factor is an alteration in the plane of the lumbosacral joints which may be oblique or horizontal and thus predispose to subluxation. Elongation of the laminæ was the cause of slipping in two of the author's cases.

Most authors are agreed that trauma is a prominent factor in the etiology of the majority of the cases. A single severe trauma or a succession of injuries may produce the condition in those that are predisposed by congenital malformations.

Several plates illustrate the condition and show the value of X-ray examination.

Jacob Sagel, M.D.

BRINKLEY'S BROADCASTING STATION

The Federal Radio Commission refused to renew the broadcasting license of Station KFKB, of Milford, Kansas, operated by John R. Brinkley, because it was operated mainly in the interest of Brinkley and his associates rather than in the interest of the public. Brinkley appealed the case to the courts but this appeal has been denied. (Jour. A. M. A., February 14, 1931, p. 547.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Modern Methods of Treatment. (Fourth Edition). Logan Clendening, M.D. 819 pages. Illus. Price, $10.00. Saint Louis: The C. V. Mosby Company, 1931.

Abdomino-pelvic Diagnosis in Women. Arthur John Walscheid, M.D. 1000 pages. Illus. Price, $12.50. Saint Louis: The C. V. Mosby Company, 1931.

How It Happened. A. G. Bettman, M.D., F.A.C.S. 110 pages. Price, $1.00. Philadelphia: F. A. Davis Company, 1931.

Common Contagious Diseases. Stimson. 353 pages. Illus. Price, $3.75. Philadelphia: Lea & Febiger, 1931.

General Medicine, Practical Medicine Series. Weaver, Brown, Minot, Stroud, Brown. 848 pages. Price, $3.00. Chicago: The Year Book Publishers, 1930.

Cancer. Willy Meyer. 427 pages. Illus. Price, $7.00. New York: Paul B. Hoeber, 1931.

Textbook of Human Embryology. Cleveland Sylvester Simkins, Ph.D. 469 pages. Illus. Price, $4.50. Philadelphia: F. A. Davis Company.

DISEASES OF THE GENITO-URINARY SYSTEM IN INFANCY AND CHILDHOOD (Clinical Pediatrics, Volume XIX). Henry F. Helmholz, M.D., and Samuel Amberg, M.D. Supervising Editor, Royal Storrs Haynes, Ph.B., M.D. 239 pages with contents, 27 illustrations, 43 cases, references at the end of each of the eleven chapters, and an index. Price: $85.00 per set of 20 volumes and general index. Sold only in sets. New York, London: D. Appleton & Co., 1930.

This volume reads like all of the highly dependable, well organized, very helpful works of the authors. It combines the experimental with the clinical; is clearly lucid, concise and to the point. The references are very complete and cover even the most recent contributions. The illustrations and cases are very clarifying. It is to be highly endorsed and recommended in its entirety for the student, pediatrician and general practitioner. There is a human key-note throughout—let pediatricians be keenly alert to safeguard the child by a correct diagnosis for the future health of the adult.

Lillian L. Nye, M.D.

GENERAL MEDICINE: The Practical Medicine Series. Edited by George H. Weaver, Lawrason Brown, George R. Minot, William B. Castle, William D. Stroud, and Ralph C. Brown. Cloth. Price $3. Pp. 830. Chicago: The Year Book Publishers, Series 1930.

The general arrangement of the volumes, eight in number, in this series, is familiar to the profession. The book is divided into five parts. The first, on Infectious Diseases, emphasizes the newer diseases, as psittacosis, undulant fever, and tularemia; aspects of newer methods in treatment, as the use of whole blood in measles, immune serum in poliomyelitis, and the prevalence of epidemic diseases in various parts of the country. Part 2 takes up diseases of the chest (excepting the heart). Home and sanatorium treatment of tuberculosis is discussed, as are special measures, vaccine, diet, rest, lung collapse, and diagnosis. The bulk of the section is on tuberculosis. Part 3 reviews the years' literature on the blood and blood-making organs. There is considerable discussion of the reticulocyte count in health and disease; of nomenclature in the anemias, of anemia as a deficiency disease, of the extent and nature of the response, in anemia, to liver and liver extract, of transfusion, and some of the rarer blood diseases. A most interesting section. Part 4 deals with diseases of the heart and blood vessels. The discussion follows the general headings of etiology, anatomical considerations, physiological abnormalities, treatment, and miscellaneous topics. The final section is devoted to diseases of the gastro-intestinal tract, and diseases of metabolism.

E. C. Hartley, M.D.

ARTERIAL HYPERTENSION. E. J. Stieglitz, M.D., Assistant Professor of Clinical Medicine, Rush Medical College, Chicago. Price $5.50. New York: Paul B. Hoeber, 1930.

The presentation of a subject the etiology of which is practically unknown is here well done. The author has exhaustively gathered together facts pertaining to this condition, and has done much to present the subject in a clarified manner which will be appreciated by the general practitioner. It is essentially a careful review of the literature with a resulting presentation of our present knowledge of the subject, and indications of lines of research which should be undertaken.

The underlying anatomy, and physiology, and the pathogenesis of hypertension is given satisfactorily. The difficulty of treatment is well recognized, and the views of various workers are given with remarks concerning the author's opinion of them. The question of hypertension in pregnancy is adequately considered, and the problem of the management of the late results of the condition, cardiac and renal, is discussed without noteworthy alterations from accepted opinions.

Summarizing, the author has presented a live subject in a most satisfactory manner, and the monograph, well written, should be of real interest to the practitioner.

Joseph A. Borg, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

WANTED—Part time appointment by Minneapolis physician. Address D-125, care of Minnesota Medicine.

PHYSICIAN'S OFFICE FOR RENT—Best location Midway district, corner Thomas and Hamline, Saint Paul. Rent $25.00 a month. Inquire at dentist's office.

WANTED—Recent (German speaking) graduate to take over my practice. Must be of good habits and well qualified. Nothing to sell. Address D-124, care of Minnesota Medicine.

FOR SALE—Minnesota—In town of 2500, rich German community, on Jefferson and Coast to Coast Highways, well established practice, five bed hospital, residence combined, well equipped office. Will consider partner with small investment, or sell at sacrifice a $15,000 yearly cash practise. Reason: Poor health. Address D-128, care Minnesota Medicine.

WANTED—Position by experienced medical secretary. Graduate Medical Secretarial Course, Rochester, Minnesota. Address D-127, Minnesota Medicine.

POSITION WANTED—By Laboratory Technician skilled in Physiotherapy, X-Ray, Basal Metabolism. College Graduate. Hospital training and experience. Address D-126, c/o MINNESOTA MEDICINE.

FOR SALE—Lease of office, 516 La Salle Building, Minneapolis, and complete office and X-ray equipment of the late Dr. H. N. Meleck, including goodwill and referred work from six industrial and insurance firms. Office may be inspected any time during the day. Telephone Geneva 5592.

FOR SALE—All furniture and equipment for modern seven room hospital. In splendid condition. Bargain if interested. Address D-129, care Minnesota Medicine.

INSTRUMENTS FOR SALE

An exceptionally complete set of surgical instruments and office equipment, property of the late Dr. Lyng, is for sale. Especially suitable for hospital. May be seen at 5145 Woodlawn Avenue, Minneapolis. Telephone Dupont 8948.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XIV MAY, 1931 No. 5

RESULTS IN PERINEAL PROSTATECTOMY*

AN ANALYSIS OF THREE HUNDRED AND TWENTY-THREE CONSECUTIVE CASES

Edwin Davis, M.D.
Omaha

PROSTATECTOMY, like all other surgical procedures, has a two-fold purpose, the prolonging of life and the relief of suffering. In analyzing the results of prostatectomy, with the purpose of determining what is to be expected from this operation, we are therefore primarily interested in: (1) the immediate mortality rate, and (2) the late functional results. For obvious reasons, the second of these considerations is almost as important as the first.

In answering the question as to what prostatectomy has to offer to the patient, we must be guided by statistical data, covering the mortality rate and the percentages of immediate and late complications, as well as the percentage of satisfied or well patients. Data for such a purpose may be best obtained by an analysis of a series of similar cases, handled in the same manner and preferably by the same diagnostician and the same surgeon. The larger the series, the less the inaccuracy in the conclusions. It is my purpose briefly to present two tables summarizing the immediate and the late results in a consecutive series of 323 cases of perineal prostatectomy under sacral block anesthesia. Since this paper is intended merely as a brief presentation of operative results, all details of diagnosis, preparation and operative technic have been purposely omitted. In a recent publication[1] I summarized the immediate and late results in a series including 176 cases of perineal prostatectomy under sacral block anesthesia. The tables here presented include the above data, plus the additional information gained from 147 subsequent cases, similarly handled.

IMMEDIATE OPERATIVE RESULTS

Prostatectomy is no longer the hazardous procedure of former years, with a mortality rate of 20, 30, or 40 per cent, although this idea still persists to a very considerable degree in the mind of the laity and of many members of the profession as well. Authentic figures, available from several urological clinics, go to prove that the risk of this operation, during comparatively recent years, has been reduced to almost nil, so that the statistics of prostatectomy upon the aged may now compare very favorably with, for instance, the statistics of herniotomy upon the young and robust. There are three essential factors which have contributed largely toward this conspicuous lowering of the mortality rate of prostatectomy. These are: (1) proper preoperative preparation; (2) sacral block anesthesia; and (3) complete hemostasis.

Preliminary Drainage.—The first, and the most important of these, preliminary drainage, is a subject which has been dwelt upon in recent years in many publications by competent authorities, and the importance of which has become too well recognized to require discussion at this time. The neglect of this most essential phase of the subject of prostatectomy will have, as its inevitable consequence, an appalling mortality rate. Each patient in this series, upon entering the hospital, was advised that the period of preliminary bladder drainage averages three weeks. Many of them spent a considerably longer period in the hospital prior to the operation, while a few were sent home with suprapubic drainage tubes for periods ranging from one to several months. In no other way than by attending to this important item with scrupulous care and rigid insistence, is it possible to avoid unnecessary prostatectomy deaths. Even in the case of patients in apparently splendid condition, and with satisfactory renal functional tests, I have adopted a ten-day preliminary drainage period (with normal temperature) as a minimum, and deviate from this rule under no circumstances. Patients insisting upon immediate operation, and fretting because of the delay, are advised that they are at liberty to go elsewhere.

---

*From the Department of Urology, University of Nebraska College of Medicine. Presented before the Southern Minnesota Medical Association, Mankato, Minnesota, August 25, 1930.

Sacral Block Anesthesia.—It may be stated without exaggeration that the sacral block method affords an ideal form of anesthesia for perineal prostatectomy. In a word, sacral block anesthesia is easily and quickly administered, it carries with it no hazard, and is entirely dependable. In fact (as figures cited below will show). the sacral block method may truthfully be said to be infallible in producing results, if properly administered. This method is also admirably suited for suprapubic prostatectomy, although, for this route of approach, additional local infiltration anesthesia of the abdominal wall must be provided. It is quite important to point out with emphasis that sacral anesthesia differs essentially from spinal anesthesia in being extradural, while the latter is intradural and carries with it a certain hazard of its own. Other than this statement, the details of technic of sacral anesthesia have been purposely omitted, since this subject has been fully covered elsewhere.[2]

Assuming familiarity with the technic, the complete sacral block injection may be carried out with comparative ease in about ten minutes' time. The risk is negligible, in that there has not been an anesthesia death during the entire series; neither has there been a reaction of consequence. Although slight reactions, characterized by a moderate drop in blood pressure and by more or less pallor and perspiration and more rarely by nausea, are not uncommon, there has not been a single instance in which the reaction was in any measure alarming.

The chief objection to the sacral method in the hands of different observers has been the rather small percentage of cases in which there has been inexplicable failure to produce satisfactory anesthesia. The figures here presented, and those presented in a former paper published in 1924, are of interest in this connection, and tend to throw some light upon the cause of this occasional failure. In this former paper[3] I reported a series of thirty consecutive cases of perineal prostatectomy under sacral block anesthesia. Among this series, three were complete failures, while four required additional gas inhalation anesthesia during the final stages of enucleation. Thus, seven out of thirty, or 23.3 per cent, were unsatisfactory for reasons not understood. In the present series, there has not been a single case requiring gas inhalation anesthesia during the last 172 consecutive cases; and out of the last 230 cases, gas has been necessary during the final stages of enucleation in one instance only. Thus the percentage of failure has been reduced from 23 per cent to 0.4 per cent. Since in all instances the same drug in the same concentration has been employed, and since there has been no deliberate modification in the technic of injection, the only logical conclusion is that through practice the anesthetist has learned to place the needles more accurately. In other words, it is possible for the anesthetist to be mistaken in considering that the needle point has been properly placed within the caudal canal or in the foramina, and the percentage of failures may thus be adequately explained upon a technic basis, without recourse to the various anatomical and physiological theories which have been advanced. It may, therefore, be conservatively stated that sacral block anesthesia for perineal prostatectomy is free from risk and is uniformly efficient when properly administered. Thus the method of anesthesia which is easy, safe, and infallible leaves nothing to be desired.

Hemostasis.—In addition to the group of prostatectomy deaths due directly to hemorrhage, there is another larger group in which death later results indirectly from hemorrhage, by reason of infection secondary to lowered resistance. The importance of hemorrhage as a mortality factor is probably underestimated by reason of failure to recognize the primary cause of death in this second group of cases. The necessity for detailed attention to complete hemostasis, therefore, cannot be overemphasized, and, for the same reason, haphazard hemostatis in prostatectomy will have its inevitable consequence in a certain percentage of cases. It is quite true that the majority of patients, properly prepared, will survive by the trust-to-luck method of hemostasis, but if the minimum mortality rate is to be achieved, this important item is not to be neglected.

Prostatectomy may ordinarily be accomplished with very little bleeding, and in many instances the operation may be made almost bloodless, as the result of: (1) the opportunity for deliberateness in controlling individual bleeding points in and around the prostatic capsule by suture and ligature, through the time afforded by the use of sacral anesthesia; and (2) the use of an inflated hemostatic bag for the purpose of controlling hemorrhage during the first few post-operative hours. For this latter purpose, in all the cases here reported, a perineal prostatic hemostatic bag, described in a previous publication,[4] was employed. This bag (Fig. 1) is a distensible cone-shaped balloon, which is introduced through the internal sphincter into the bladder immediately after the enucleation of the gland; and the apex of which is maintained in the prostatic urethra in such a manner as to fill the prostatic cavity snugly, and (which is more important) to retain, rather than evert, the torn edges of bladder mucosa. This bag differs from the Hagner suprapubic bag in two essential respects:

1. The perineal bag is maintained in place by means of direct traction via the perineal incision (and counter-traction against the perineum), rather than by indirect traction via the urethra.
2. In the absence of a suprapubic fistula, adequate provision for urinary drainage is accomplished by means of a large, through-and-through, stiff-walled rubber tube, traversing the bag from apex to base, without communicating with the interior.

The caliber of this through-and-through drainage tube (internal diameter) is 0.25 inch. Communicating with the interior of the bag near its apex is a much smaller tube, through which the bag is distended. The traction loop of rubber, for maintaining the position of the bag, and later for facilitating removal, is attached to the large tube just at its junction with the apex. A tape passes through the traction loop, and through a hole in the center of an oval piece of metal, and traction is maintained by means of a screw-clamp, the oval metal having been placed flush with the skin surface immediately after closure of the incision. In place of the oval metal and screw-clamp, an ordinary hemostatic clamp (separated from the wound by a pad of gauze) may be substituted. The length of the bag (apex to base) is 6.5 cm., and its diameter at the base (when distended with 60 c.c. of water) is 4.5 cm.

The bag is introduced into the bladder through the prostatic cavity and the internal sphincter, immediately upon completion of the enucleation. After distension with air, traction upon the tape is immediately begun, which results in pulling the tissues surrounding the bladder neck down into the prostatic cavity, obliterating lax open spaces and compressing the torn edges of bladder mucosa. With rare exceptions, hemostasis is immediate, complete, and permanent. The traction is relaxed after three hours, the air released from

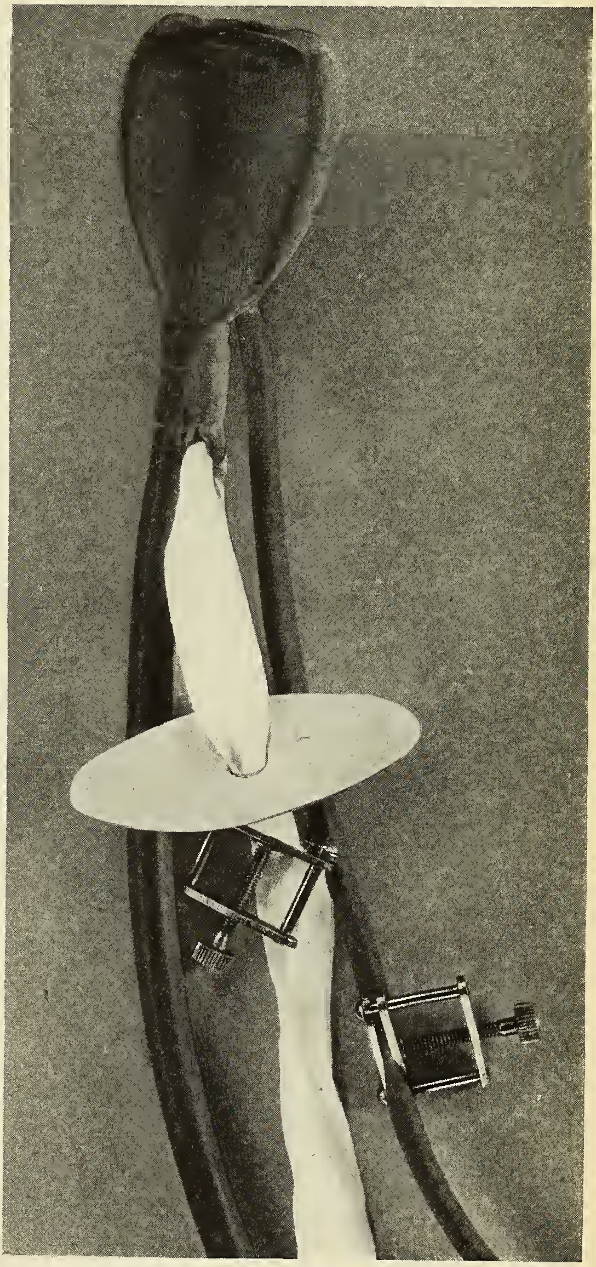


Fig. 1. Davis perineal prostatectomy bag.

the bag after twenty-four hours, and the collapsed bag is withdrawn through the perineal fistula after forty-eight hours. Immediately after the operation, the urine is usually yellow in color, and is seldom more than pink-tinted. Upon the rare occasions that hemorrhage recurs, the bag may be re-distended with air, the traction renewed, and the clots aspirated through the large, stiff-walled tube. A very efficient method of hemorrhage control during the first forty-eight post-operative hours is thus provided. It may, therefore, be stated without exaggeration that, with proper attention to preparation, anesthesia, and hemostasis, the problem of the immediate mortality of prostatectomy may be considered to be satisfactorily solved, with one reservation only. I refer to delayed hemorrhage. As may be noted in Table I, this complication has occurred in eight cases out of 323. Sudden, profuse hemorrhage, occurring as late as the tenth post-operative day, and interrupting an otherwise smooth convalescence, is a menace which may be neither foreseen nor prevented, and which occurs probably as the result of infection and slough. This constitutes a grave emergency, in that its seriousness may not be recognized until the patient has gone into collapse. Hemorrhage of this character is a complication which should not be temporized with, and which calls for immediate re-introduction of a bag or pack. In four of the above cases, an immediate suprapubic incision was made under local anesthesia in order to permit evacuation of clots and the introduction of a Hagner bag. Hemorrhage of this character was indirectly responsible for one of the eight deaths, in that the patient's resistance was lowered by loss of blood to such an extent that gangrenous infection of the incision set in, resulting in general sepsis and death ten days later. In this connection, it is of particular interest to note that one patient had two of these massive, exsanguinating delayed hemorrhages, occurring on the tenth and the thirty-sixth post-operative days, respectively. The first was controlled by a re-introduction of the bag through the perineal fistula, and the second by open suprapubic incision under local anesthesia. This patient survived. The amazing interval of time (thirty-six days) between the prostatectomy and the second massive hemorrhage is worthy of note, and serves to remind us that the delayed hemorrhage menace is ever present, although sufficiently rare to be conspicuous only in the large series of cases.

Table I

PERINEAL PROSTATECTOMY UNDER SACRAL ANESTHESIA
Immediate Results

Total consecutive cases	323
Average age	70
Above eighty	21
Deaths	8
Mortality rate, per cent	2.48
Total consecutive cases with no deaths	121
Sacral anesthesia (consecutive cases without failure)	172
Rectal injury	1
Postoperative "shock"	0
Delayed hemorrhage (several days)	8
Epididymitis	37

SUMMARY

The immediate operative results are shown in Table I. Although there were 121 consecutive cases without a death, there were eight deaths in the entire series of 323, a mortality rate of 2.48 per cent. This mortality rate represents a faithful and accurate recording of all deaths, due directly or indirectly to the prostatectomy, or occurring from any cause whatever during the patient's stay in the hospital. Among the eight deaths there has been included one which occurred on the thirty-ninth post-operative day. This patient was a very weak and frail old man of seventy-nine, who did well for the first three post-operative weeks, but who finally passed out from no apparent cause, other than lack of vitality and resistance. As an evidence of this he developed an abscess in the calf of the leg a few days prior to death. Since the site of the operation was in good condition, and since a period of thirty-nine days had elapsed, this was clearly not a prostatectomy death, yet this case has been nevertheless included. Of the seven other deaths, two were due to late general sepsis, three to renal insufficiency, one to pulmonary embolus, and the other to acute cardiac decompensation, occurring on the sixth post-operative day. One additional death, occurring on the fifty-first post-operative day (from renal insufficiency) I have considered could be honestly and properly excluded from the series, since this patient was up and fully dressed at the end of the third week and had been given permission to return home. Although the incision was entirely healed and although the urine was passing normally per urethra, this patient voluntarily chose to remain in the hospital awaiting the development of better urinary control.

The average age figure (70 years) is undoubtedly fairly accurate, although not representative of the entire series, in that this figure was compiled from 100 consecutive cases only. There were twenty-one patients above eighty years of age in the entire series.

With respect to the dependability of sacral block anesthesia, it is to be particularly noted that the necessity for additional gas inhalation anesthesia has arisen in not a single instance in the last 172 consecutive cases. As pointed out above, however, sacral anesthesia failures were much more frequent earlier in the series.

The one case of rectal injury at operation did not result in the development of an urethrorectal fistula because the urinary stream was diverted during convalescence by suprapubic aspiration, and because the location of the lesion was very low down upon the anterior rectal wall, just above the sphincter ani. This was due to an avoidable technical error at operation.

The subject of delayed hemorrhage, occurring about the tenth post-operative day (eight cases) has been discussed above.

There were thirty-seven cases of post-operative epididymitis, occurring during the first six weeks. This figure is too high, since epididymitis, occurring toward the end of a long period of hospitalization when the patient's morale has been all but exhausted, is a very trying and discouraging complication. For this reason I have since adopted preliminary bilateral vasectomy as a routine prophylactic measure, and shall subsequently publish comparative figures.

Table II

PERINEAL PROSTATECTOMY UNDER SACRAL ANESTHESIA

Late Functional Results

Total consecutive cases questioned	200
Time elapsed since operation	3 to 24 months
Patient's own opinion:	
Well	164
Improved	32
Unimproved	4
Incontinence:	
Complete	0
Inconvenient	2
Slight	3
Nocturia:	
Not at all or once	43
Once or twice	21
Two or three times	11
Four or more	11
Urinary fistula:	
Complete	0
Slight	6
Recto-urethral fistula:	
Immediate	0
Late	2
Retention of urine	1

LATE FUNCTIONAL RESULTS

Table II summarizes the late functional results as determined by questionnaire blanks returned from 200 consecutive patients. These data were compiled during May, 1928, and June, 1930. On account of the recognized impossibility of communicating with all of a consecutive hundred of these patients, 250 questionnaire blanks were sent out to as many consecutive patients. From the replies, those of the last consecutive 200 patients operated upon were selected. In order to avoid complications and misunderstandings, only the following simple, direct questions were asked.

1. Is the wound entirely healed?
2. Can you control the urine?
3. Do you pass urine too often?
4. How many times do you get up at night to urinate?
5. Does the urine pass without difficulty?
6. As far as the operation is concerned, do you consider yourself (1) well, (2) improved, or (3) unimproved.

The last question was considered to be the most important, since this was for the purpose of obtaining a voluntary expression of the patient's own opinion as to the result of the operation. As shown in Table II, 164 of these patients unequivocally state that they consider themselves well, while there are thirty-two improved and four unimproved. An analysis of these data shows that of those patients who list themselves in the improved group rather than in the well group, practically every one has done so on account of urinary frequency, or on account of some other wholly unrelated cause for which the prostatectomy cannot under any possibility be considered responsible. Such patients, however, have nevertheless been classified according to their whims rather than in accordanec with the known facts, since this table is intended to represent the patient's own unbiased opinion. In this connection it is to be noted that in a post-prostatectomy series, there would necessarily be a fair percentage of cases of advanced pyelonephritis and other chronic infections such as to prevent all possibility of the return of the urinary tract to normal. Therefore, even after the obstructive symptoms have been done away with by prostatectomy, the persistence of urinary frequency in a certain percentage of cases is inevitable. The average intelligent patient, however, recognizes that relief from obstructive symptoms is more essential than relief from minor degrees of urinary frequency. This is demonstrated by Table II. Although approximately only 60 per cent of these patients report themselves as being disturbed as few times each night as once or twice (or not at all), as many as 80 per cent voluntarily express themselves as being well.

The question of post-prostatectomy incontinence is a subject deserving careful consideration. Although there was no case of complete incontinence in this series of 200, there were two with a sufficient degree of incontinence to be a cause of considerable inconvenience. While each of these patients has intervals of complete dryness and has the ability to start and stop the urinary stream at will several times while voiding, there is a weakness of the external sphincter, as indicated by leakage, at intervals, of small amounts on any undue exertion, such as coughing or sneezing or suddenly rising. Since these patients have intervals of complete dryness, and since they have the ability voluntarily to start and stop the urinary stream, it is evident that a sphincteric structure exists and it is, therefore, logical to consider the possibility of individual anatomic variation in the musculature or innervation of the external sphincter. I have under observation at the present time, two patients with this identical type of sphincter weakness following suprapubic prostatectomy. In this connection, I do not intend to minimize the possibility of external sphincter injury by the perineal operation. It is to be frankly stated that this is a very real danger, particularly in those cases in which the internal sphincter has been rendered functionless by the gland itself. In addition to these two, there were three others with slight degrees of incontinence.

It is likely that in at least some of these five cases the unsatisfactory control resulted from technical error at operation.

One case of complete urinary fistula resulted from the formation of a fibrous stricture or septum at the apex of the prostate. Since this condition has subsequently been restored to normal by internal urethrotomy, this fistula no longer exists. The six patients with slight perineal urinary leakage each complained of the escape of a few drops of urine at intervals through the perineum at the time of voiding. In each case, this condition existed over a period of several months. Four of these have been subsequently cured by a secondary minor plastic operation. Another has been lost sight of. The sixth has a persistent perineal fistula in spite of a secondary attempt at plastic repair. Failure to obtain satisfactory healing in this case, however, may be explained by the fact that this patient shows a four-plus Wassermann test.

There has been no case of immediate postoperative urethro-rectal fistula. One patient, in a very debilitated and weakened condition, had a long, protracted convalescence associated with perineal pain and an elevated temperature over a period of three or four weeks. Five weeks after operation he developed a leakage of urine into the rectum, this fistula having occurred presumably as the result of a periprostatic abscess. Another developed an urethro-rectal fistula upon the tenth post-operative day, occurring presumably as the result of technical error at operation, although there was no evidence of rectal injury at the time. This fistula subsequently was successfully repaired by the Young-Stone operation.[5]

The one patient having post-prostatectomy retention of urine was found at autopsy to have an unsuspected vesical carcinoma, situated in the region of the prostatic orifice.

Again referring to the mortality rate (2.48 per cent) in this series of patients averaging 70 years of age, it is of interest to compare this figure with those of the American Experience Tables of Mortality which are used as a legal standard for actuarial computations by life insurance companies. According to this table, of 1,000 individuals living at the age of 70, slightly more than 6 per cent are expected to die from natural causes (that is, without any operation) before reaching the age of 71. Therefore, since the total of eight deaths in this series includes deaths from all causes, it is logical to conclude that this mortality rate of 2.48 per cent could be adjusted considerably lower, if it were possible to distinguish between deaths due to prostatectomy and deaths due to natural causes. This is rather a theoretical consideration, but serves to further emphasize the above statement that recent developments in prostatic surgery have served to reduce the mortality rate to almost nil.

CONCLUSIONS

1. Present day methods (preliminary preparation, sacral anesthesia and hemostasis) are such that prostatectomy has come to be a benign procedure with a negligible mortality rate (2.48 per cent in 323 cases).

2. Assuming proper attention to the above details, the chief hazard of prostatectomy is that of sudden, profuse and exsanguinating secondary hemorrhage occurring as late as the tenth post-operative day. This hemorrhage should be treated as an emergency measure and should be checked by mechanical means even though a secondary operation may be necessary. Under these circumstances, it is an error to wait and hope that this hemorrhage will cease.

3. As far as the late functional results are concerned, it is conservative to expect 82 per cent of "well" patients and 98 per cent well or mproved.

4. Urinary frequency, persistent to a greater or lesser degree following prostatectomy, even hough the cause of mechanical obstruction has been removed, is the chief reason why 16 per cent of these patients consider themselves merely "improved" rather than well.

5. With respect to late functional results, the chief hazards of the perineal operation are those of injury to the external bladder sphincter and to the rectal wall. It seems conservative to consider that these hazards are more than compensated for by the lower mortality rate following the perineal operation.

REFERENCES

1. Davis, Edwin: Perineal prostatectomy under sacral anesthesia; one hundred and seventy-six consecutive cases. Jour. Am. Med. Assn., 91:1618 (Nov. 24), 1928.
2. Davis, Edwin: Perineal prostatectomy under sacral anesthesia. Nebraska State Med. Jour., 10:8 (January), 1925.
3. Davis, Edwin: Perineal prostatectomy, with particular reference to sacral anesthesia and to hemostasis. Jour. Am. Med. Assn., 83:1988 (December 20), 1924.
4. Davis, Edwin: Distensible bag for hemostasis and drainage following perineal prostatectomy. Jour. Urol., 18 (August), 1927.
5. Davis, Edwin: The Young-Stone operation for urethro-rectal fistula. Surg., Gyn. and Obst., 225 (March), 1921.

ACUTE POLIOMYELITIS*

Edward T. Evans, M.D., F.A.C.S.
Minneapolis

When the "Black Death" scourged the continent of Europe, people, panic-stricken, dumbly accepted the visitation without hope of survival if stricken, and with a fatalistic attitude which reflected their hopelessness.

Though anterior poliomyelitis existed as early as 2300 B. C., as evidenced by an Egyptian mummy described in 1927,[1] though the disease was recognized as an entity in 1734[2] and has been reported and described frequently prior to this century, it is only in the past two decades that it has assumed proportions so widespread as to focus public attention.

The disease is without question the most insidious, perhaps the most contagious, and certainly the most devastating in its manifestations, that medical science is called upon to combat—far exceeding the "Black Death" in its ultimate economic toll.

Rather than review its epidemiology, its history, and its recent epidemics elsewhere, let me call your attention to the fact that during the past five months Southwestern Minnesota has borne the brunt of a severe and virulent outbreak. To date some 172 cases have been directly or indirectly brought to my attention and it is my hope that I can, in the few minutes allotted to me, arm you with the most effective means of preventing loss of life and function.

The cause is unknown as yet—it is probably a filterable virus[3] or may perhaps be a pleomorphic streptococcus, as suggested by Rosenow. Its virulence varies in epidemics and in individual cases. It is most probably highly contagious and manifested in a widespread systemic form with, in a certain low proportion of cases, a subsequent central nervous system invasion. This invasion depends on certain poorly-understood factors, notably virulence and lowered meningeal resistance.

Its pathology, in the paralytic stage, is a round-cell infiltration deep in the nerve tissue, apparently blood-borne, with resultant death of nerve cells lying in the anterior horns of the spinal cord.

Its early diagnosis depends on the keenness of observation of the attending physician and its hopeful treatment depends on his early and fearless carrying out of the procedures I shall outline below.

Given a child, isolated or in the midst of an epidemic, who, following a comparatively mild respiratory or gastrointestinal upset, develops a headache with slightly rigid neck and painful back, together with a mild prostration and a rather wide-eyed, fearful, "follow-you around" stare—suspect poliomyelitis in its preparalytic stage, and proceed to corroborate your diagnosis and institute treatment.

To wait for further neurological signs, such as nerve tenderness or paralysis, is to court disaster and to label yourselves unworthy of your profession.

Take your microscope and counting-chamber to the child and perform a lumbar puncture immediately. Observe whether there is an increased intraspinal tension and immediately make your cell count. A polymorphonuclear increase, if epidemic spinal meningitis can be ruled out by a clear fluid, warrants a diagnosis of preparalytic anterior poliomyelitis.

And by this one procedure alone you have instituted one of our most effective means of treatment, as shown by the reports of Montgomery and Cole,[4] Aycock and Luther,[5] the Detroit epidemic, and a series of fifty-five cases of the author in 1925. Lumbar puncture probably decreases edema of the cord and this saves nerve cells otherwise doomed. It is effective also in many cases during the early paralytic stage.

Having established your diagnosis, you must devote all your attention to the prevention of paralysis.

Despite much research and many reports to the contrary, it is the consensus of opinion to date that no specific immune serum has been experimentally produced which is satisfactory. Until further corroborative evidence is brought forth, convalescent serum alone offers a real hope.

My statement requires some explanation. Flexner[6] showed that horse serum or other foreign protein serums, when injected in monkeys, so disturbed the meninges and choroid plexus by their reaction that the amount of virus necessary to produce symptoms of invasion was greatly reduced. He has even gone so far as to state that simple lumbar puncture may increase the permeability of the meninges and choroid plexus to the virus. And it is because of this action of foreign protein that I unhesitatingly decry the use of certain stock serums, even if convalescent serum is not obtainable. I have personally witnessed the rarest of all phenomena, a secondary invasion of the upper extremities two weeks after the invasion of the lower extremities had become stationary. This secondary invasion was coincident with the development of serum urticaria.

---

*Read before the Northern Minnesota Medical Association, Moorhead, Minnesota, September 19, 1930.

W. H. Kellogg[7] less than a year ago showed the fallacy of depending too much on clinical reports and urged the adoption of careful comparative studies and further laboratory research on this subject. Too many factors enter into the analysis of statistics, such as variation in virulence, unconscious reasons for selection of cases for treatment with one type of serum or another, accuracy of diagnosis, and prejudices inherent in the clinical observer.

Experimental data alone are unbiased. Monkeys are used and virucidal (that is, toxin-neutralizing) power must be demonstrated. Even so, the comparison of monkey and child is difficult because:

1. To give serum alternately requires cold-blooded courage, especially if one has any confidence in one form of treatment.

2. The child under treatment is already infected. The monkey is to be infected and the serum has proven to be more effective in preventing than in curing the disease after it is established.

Therefore, if the serum is to be used it should have proven virucidal powers. At present, convalescent human serum alone exhibits this neutralizing effect consistently and is proven experimentally effective.

While it is probable that most adults are immune, it has been shown by Flexner that normal serum has no protective value and the serum should be that of convalescent cases, and preferably within six months or a year of their attack, to insure the presence of antibodies in concentration.

If the whole blood is used it should be grouped if given intravenously. This is not necessary if given intramuscularly. Serum need not be grouped and is good for from six to ten months if kept properly.

The dosage recommended by Aycock and Luther is 20 c.c. intraspinally on successive days, though the dosage has not yet been established.

There is a controversy as to method of administration—whether intramuscular, intravenous, or intrathecal. I have already mentioned the effect of spinal puncture and shown its advantages as contrasted to its dangers. It is probable that a meningeal invasion already represents permeability of the meningeal barrier. Though some point out that the lesions are along blood vessels and argue that the serum should be so administered that the blood carries the immune bodies to the lesion, there are many reports indicating the advantages of intrathecal administration. It may be used in 10 c.c. doses intraveously followed by lumbar puncture and repeated in twelve hours intramuscularly followed by lumbar puncture somewhat as in the treatment of central nervous system syphilis. My own feeling is that much value accrues from the repeated lumbar punctures alone and that the intrathecal administration of serum is as safe, and certainly as effective, as the other means. Real value should be expected of the serum only in the preparalytic stages, as shown by the accompanying table compiled by the University of Manitoba Research Committee.

The report stated that in Group III the onset of paralysis was earlier than in Groups I and II, which raises the question as to possibly graver prognosis, and vice versa.

In conclusion, then, the case should be recognized early, diagnosed early, and treated fearlessly.

TABLE I (161 CASES)

	Number	Stage	Serum	Recovered	Residual Paralysis	Dead
I.	57	Preparalytic	One intramuscular dose	93%	7%	0
II.	17	Preparalytic	Two or more intramuscular doses	94%	6%	0
III.	33	Postparalytic	Various routes	22%	45%	33%
IV.	54	Postparalytic	Not given	26%	63%	11%

Note: Groups III and IV: No case made for serum after paralysis.

If paralysis has already occurred the same treatment should be instituted, especially the repeated lumbar punctures.

The orthopedic treatment begins immediately and is two-fold:

1. The prevention of tiring stimuli.
2. The prevention of deformity.

The first is accomplished by placing the patient in a quiet, comfortable room and supplying his every want so as to require the least expenditure of mental and physical effort on his part. E. D. Ebright,[8] of Kansas, even advocates a total body cast to preclude all external stimuli, though the author feels the attendant discomfort and resulting atrophy may defeat the end in view.

The second is accomplished by the early and adequate splinting of the affected parts in the optimum position of muscular relaxation. That this is essential is shown by a case at present under care at the University Hospital. Careful muscle tests showed involvement of both lower extremities and the left upper, so she was placed in double long leg plasters and left body, shoulder and arm spica. Two weeks later, despite the fact that no demonstrable paralysis was earlier found, the right deltoid had weakened because of its overuse and stretching in an adducted position. It also was then supported in an abduction plaster. The whole plaster splints are worn constantly for six or more weeks, till all tenderness subsides. I say constantly, because a month's recovery of tone may be lost in one stretching of an involved muscle. Thereafter, the splints are worn at all times for six months or more except when carefully removed for institution of graduated massage, careful muscle training or other rehabilitative measures.

Just what forms of splinting or bracing will be used in this late portion of the second stage will depend largely upon the individual case and the ingenuity or facilities of the attending physician. I cannot, however, stress too strongly this protective stage instituted as soon as the paralysis appears and continued for months until all possible recovery of the affected muscles is obtained. There still is considerable controversy on this matter between neurologists and orthopedists. This is due, I believe, to the neurologists considering nerve function alone, whereas the orthopedist is forced to consider muscle tone and function. We who see these patients with late deformities and weak, stretched muscles know that the muscle does not recover well unless held in relaxation till all irritation is past, and then is so weak that it must be carefully held during the re-education of nerve centers. Paradoxical as it seems, we have often seen returning muscle function long before the faradic reaction of a nerve returns. This was demonstrated conclusively in the nerve suture cases during the war. And again we have observed cases of infantile paralysis progressing nicely in braces, only to see them go on to irreparable loss of action on too early removal of braces. And we have never seen a deltoid muscle recover from paralysis if allowed any early stretching.

We who are constantly faced with the difficult task of reconstructing these patients beg that they be efficiently and carefully diagnosed, treated and protected in their earlier stages so that the economic and end-results may prove better in the future and a reflection of a high standard of professional skill.

BIBLIOGRAPHY

1. Diveley, R. L.: Jour. Bone and Joint Surg., 11:100, (Jan.) 1929.
2. MacAusland, W. R.: New Eng. Jour. Med., 200: 18, (Jan. 3) 1929.
3. Aycock, W. L.: Jour. Infect. Dis., 45:175, (Sept.) 1929.
4. Montgomery, J. C., and Cole, W. C. C.: Jour. Am. Med. Assn., 85:890, (Sept. 19) 1925.
5. Aycock, W. L.: Jour. Am. Med. Assn., 91:387, 1928.
6. Aycock, W. L.: Jour. Am. Med. Assn., 92:385, (Feb. 2) 1929.
7. Kellogg, W. H.: Jour. Am. Med. Assn., 93:1927, (Dec. 21) 1929.
8. Ebright, E. D.: Jour. Kans. Med. Soc., 30:76, (March) 1929.
9. Francisco, C. B.: Jour. Kans. Med. Soc., 31:1, (Jan.) 1930.
10. MacAusland, W. R.: Poliomyelitis. Appleton.
11. Report of University of Manitoba Research Committee.

IMPETIGO OR PEMPHIGUS NEONATORUM, WITH SPECIAL REFERENCE TO ETIOLOGY AND PROPHYLAXIS .

Robert A. Murray, M.D.
Duluth

Although impetigo or pemphigus has been a subject of common knowledge in the medical world for some time, it is only recently that its economic importance to maternity hospitals and to the doctors themselves has become impressive. The fact that so many hospitals are reluctant to divulge any information regarding their experience with this disease, bears witness to this fact.

In 1864 Telbury Fox first described and called attention to a form of vesicular eruption as seen in maternity departments. In 1891, Almquist showed the staphylococcus to be the infecting germ. In 1900 Matzenaver linked pemphigus and impetigo by the identity of the infecting organism. In 1911 Landsteiner was able to produce pemphigus lesions in a chimpanzee with material from a human lesion. Nothing new developed until 1917, when the disease seemed to change, became more virulent and appeared almost simultaneously in widespread epidemics throughout the country. The unprepared maternity wards were overwhelmed by the affliction with its high morbidity and mortality rate. No suitable explanation has been made for this universal outbreak, but the fact remains that we now have with us the menace of impetigo or pemphigus as a ghost, hovering over every maternity ward.

The disease is defined as an acute contagious inflammatory disease of the skin, in the newborn, characterized by the formation of papules and then vesicles which contain clear to opalescent fluid or pus.

Some writers use the terms impetigo and pemphigus interchangeably. Some tend to distinguish impetigo from pemphigus by the latter's greater virulence, earlier development of constitutional symptoms, greater morbidity, and poorer prognosis. Others distinguish pemphigus from the bullous exanthemata of many septic conditions and ally it to impetigo from a pathological and bacteriological standpoint.

Reed suggests grouping pemphigus, impetigo, exfoliative dermatitis, and multiple subcutaneous abscesses of the new-born as pyodermatitis neonatorum, in order to distinguish them from the same names applied to different types of lesions in older people.

Jordan makes a more specific pathological differentiation. He describes pemphigus as possibly beginning as a papule, but progressing rapidly to a bleb or bullous covering a circular fiery lesion, bright and shiny, with no ulceration, and suggesting more the appearance of a burn. These have no tendency to crust formation, discharge a clear to opalescent serum, with little increase in size, but more tendency to the formation of new lesions. These lesions are seldom on the face, never on the palmar surfaces, and occur mostly on covered areas, particularly in the skin folds, as in the axilla, groin, scalp, and under belly bands. That irritation is an important factor is shown by a predilection for moist and abrasive areas.

As impetigo he describes a red papule developing into an irregularly-shaped vesicle, flat, umbilicated, and containing a purulent fluid. There is a tendency to crust formation with the edges of the crust curling up. The lesion spreads eccentrically with irregular undermining vesicular edges. Removal of the crust leaves pus bathing an ulcerated surface. These lesions are predilected to exposed body parts, as the hands and face.

Jordan also makes a therapeutic distinction, stating that copper oleate and ammoniated mercury ointments are of value with impetigo, but have no effect on pemphigus.

In earlier epidemics the mortality was about 40 per cent, but in recent years since more attention has been paid to this condition, the mortality has been greatly reduced. Collins reports five deaths in a series of fifty cases in 1928. About 30 per cent of the infants exposed will develop lesions, and although the course is usually benign, with no effect on the infant's gain or health, in more virulent epidemics the mortality may reach 20 per cent. In transmission, healthy babies are affected as well as the weaklings. Where the umbilical cord becomes involved the outcome is usually fatal.

This condition should be diagnosed from congenital bullus syphilis, where bullæ are found on the palms and soles in infants who are constitutionally debilitated and from bullous eczema, which shows infiltration, weeping, itching, and non-pustular eczematous areas.

Exfoliative dermatitis is classed with impetigo by some writers but should be distinguished because of its fulminating course. Some cases beginning as pemphigus may progress to an exfoliative dermatitis and terminate fatally. Kohler reported a case of a normal baby developing a small bleb on the fifth day and dying on the twelfth day of exfoliative dermatitis.

Seeds reported a case of normal baby in good condition at birth who developed a purulent discharge of the right eye and vomited blackish-brown material on the second day. On the third day the temperature rose to 101 degrees F. A bullous impetigenous rash was noted on the fourth day. Pulmonary symptoms developed on the seventh day and the baby died on the tenth day. The clinical diagnosis was pemphigus neonatorum. Autopsy showed multiple lesions of the lungs from which staphylococci were isolated, and a gastric ulcer near the pyloric end of the stomach secondary to bacterial infection.

Different writers are at variance as to the organisms causing impetigo and pemphigus. Some believe the primary invader to be a skin streptococcus; others believe it to be staphylococcus aureus. The general opinion of most writers is that streptococci are the primary invaders in impetigo with staphylococci secondary, and that staphylococcus aureus is the sole invader in pemphigus.

In fifty-six cases Bolman found streptococci forty-three times, thirteen times in pure culture. He found staphylococcus aureus fifty-two times, twenty-one times in pure culture. He showed that the streptococcus alone could produce typical impetigo lesions. On direct smear from lesions the staphylococcus aureus appears as a Gram-positive diplococci, but upon culture media it assumes the typical staphylococcic clustering.

Placing the organisms on the skin of a newborn will be followed by the appearance of lesions in five to seven days. Olmstead has demonstrated that the contents of small pin-head sized papulo-pustules, which are clinically unimportant, contain many staphylococci. He states that oftentimes smears from impetigo lesions may be negative, and emphasizes that an infant once infected should not be returned to the nursery.

In some epidemics staphylococcus aureus has been cultured from cases of purulent conjunctivitis. Later reference will be made to such cases at this hospital. It is generally supposed that staphylococcus aureus may be carried in an apparently harmless form on various body regions of babies and adults. This disease is seldom found among babies born and cared for in the home. It is almost entirely an institutional infection.

Consideration of the transmission of this infection to the infants gives much material for discussion. The plausible theories are countless, but to establish these as facts becomes a problem more difficult to handle. No one can doubt that the doctor is sometimes responsible. He is in contact with infective material almost continually. His stethoscope has been used indiscriminately among his patients. The interne is also in contact with infective material through his routine duties.

The nurses carry a great part in the transmitting of this condition. As a group they are reluctant to admit any suspicious lesion because of the liability of losing time in their training, although they may be the cause of infections among babies under their care. Benians reported an epidemic in which many babies were infected in a short time. Investigation showed that the clean linen was being distributed by a person with a suppurating paronychia. Her removal was followed by a subsidence of the epidemic. He reports another epidemic which ended when one of the nurses, who was found to be suffering from a series of boils, was removed. Jordan proved two nurses to be carriers who did not have demonstrable lesions. Consideration must be given to the careless, indifferent nurse whose main interest is the completion of her duties rather than the proper execution of them.

The mother may herself be the source of the infection. One baby developed lesions on the back of the neck from a paronychial infection of the mother, and was the focus of a large epidemic in the nursery. It is acknowledged by all the writers that the genital tract of the mother may harbor pathogenic organisms. Jordan reports three mothers who developed pemphigus lesions over the sacrum following profuse lochial discharge. He reports one baby developing blebs thirty minutes post-partum, and two infants developing blebs three hours post-partum.

Waltart reported sixteen cases of infants, born with lesions, or who developed lesions shortly after birth. He reports a case of twins, one born with lesions, the other born without lesions and failing to develop any.

Nine cases are reported from the Wesley Memorial Hospital in 1925. In all the blebs leukocytes were found; five blebs were sterile and in one case a positive culture for staphylococcus aureus was obtained. One case was reported in more detail. This infant was born with fifteen pustules on a swollen scrotum. These pustules were yellow, from two to five millimeters in size, and some of the lesions showed retrograde changes. Twelve hours later pustules appeared on the hairy scalp; twenty-four hours later a subdermal fluid mass was noticed under the scalp; thirty-six hours later there appeared punctate yellow-headed pustules on the chest and abdomen. Cultures from the lesions on the scrotum showed a hemolytic streptococcus, but cultures from the other areas were negative. The mother of this infant gave a history of tonsilitis four weeks previous to delivery. This raises the question of infection going from the maternal to the fetal side through the placenta and giving rise to the disease intrauterine.

It seems plausible enough that infection may result from the vaginal or cervical secretions, where the interval between the rupture of the membranes and delivery is long enough. At this hospital, this year, an infant was born after a nineteen hour labor with a large cephalhematoma bounded from the head by an ecchymotic ring which later became necrotic. On the second day postpartum numerous punctate pustules appeared on this ring. On the third day small pustules were found on the body. Culture showed staphylococcus albus. These lesions healed in a few days under treatment with boric packs to the head, and calamine lotion to the body. Because of the short interval from birth to the development of these lesions it is most likely that this infection came from the genital tract and developed easily on the injured tissue.

Keho in his article acknowledges that the infective organism is contained in the vaginal secretion of some mothers, and that the infant may acquire the infection during birth.

Mayes and Ullian in a recent interesting article report a series of investigations, and show the high percentage of women presenting for delivery with pathogenic organisms harbored in the genital tract.

Indirect transmission must also be considered. It is quite evident that under the usual nursing regimen the infecting agent could be transferred from one mother to another, and thus from one baby to another. Through poor hygiene the mother may transfer infective material from her vaginal secretions to the infant's skin.

In most hospitals visitors are excluded from contact with the infants, but have full visiting privileges to see the mother. It is possible for the infection to be brought in by a visitor, such as the husband, and transferred indirectly to the infant at nursing time.

In the nursery the organism can be, and has been proven to be, harbored unsuspected among the various objects and equipment. Oftentimes oils, supposedly sterile, used for cleansing the babies are shown to be contaminated.

Irritation also plays a part. Many adult patients complain of the discomfort of irritation from hospital linen. The babies' clothing, laundered under the same process, is much more irritating to their more tender skin. Often the soap used in the babies' bath may be blamed because of high alkali content. That irritation does play a part is shown by the frequency of lesions developing at the sites of irritation and abrasion.

Olmstead blames the warm, moist skin from an overheated nursery and excessive clothing. In his experience, nursery epidemics are more frequent during the summer months. In contrast, at this hospital the infection predominates in the winter months.

In the average American hospital little is done in the nature of prophylaxis. The nursery supervisor should be governed by definite rules of prophylaxis as established by a group of staff physicians. It would be futile to expect or attempt a condition of surgical asepsis. To change gloves and gowns between each baby would incur too much expense to the hospital. The frequent scrubbing necessary would be too severe on the nurses' hands. However, with intelligent care and knowledge of the factors involved in the harboring and transmission of this infection, a condition of medical asepsis can be attained and the incidence and morbidity of this disease better controlled.

It is more difficult to control an extension of the infection in the general type of nursery where babies are cared for as a group, and where several nurses handle any of the babies indiscriminately. The babies should be handled as individually as possible and with an attempt at medical asepsis between them.

Several different nursery arrangements and routines as carried out in several hospitals with good results have been reported. Rulison reports the régime now used at the Sutter Hospital at Sacramento, California. The nursery is divided into sections, each accommodating six babies with their individual setups. These consist of the bassinette, a space for dressing and bathing the baby, and a shelf containing all the requisites for the baby's care. They have abandoned the spray bath and use individual bath units sterilized each day. The nursing system is so arranged that the same nurse takes care of three mothers and their three babies. These compose a unit. In the event that lesions appear, both the mother and baby are isolated under care of a separate nurse. No new patients are admitted into this unit until the other patients in this unit have been discharged and the unit cleaned.

This system carries with it a greater expense and necessitates a larger nursing staff, but Rulison states that since its institution only four suspicious cases have developed. In a training school a system in which the same nurse took care of mother and baby would be impractical for teaching purposes. It would be more feasible to divide the nursery into sections of about six babies each, with the nurses' schedule so arranged that the same series of nurses have only their group of babies and have nothing to do with the others. Also to divide the mothers into groups of the same number so that the mothers of a group of babies themselves compose a group under the care of a series of floor nurses who have no contact with other patients. I believe that the term group nursing is applied to this régime.

At regular intervals each section should undergo a thorough cleaning process, sterilizing as much as possible. In caring for the babies most writers advise that the gown be changed, and the hands scrubbed, or at least passed through an antiseptic solution, between each baby. Where a great number of babies must be cared for the time lost and the damage to the nurses' hands can be appreciated.

In many hospitals the nursery laundry is autoclaved and sent to a separate laundry where the clothing is washed by hand with a mild soap, and hung, preferably in the sun, to dry. This clothing is then delivered to the nursery in sterile packs. The purpose of this is to have the baby's clothing soft and sterile, containing as little chemical irritant as possible.

On admission to the hospital, as part of the preparation, the prospective mother should be given a complete bath, or, at least, a careful examination for suspicious lesions. Each day, postpartum, at bath time, this examination should be repeated. If any lesions develop, the mother and baby should be isolated. All babies and mothers who are placed in isolation should remain so until discharged. With this arrangement the infant population would be divided in two groups, namely, the isolated babies under the care of one nurse, separate from the general nursery, and the general group under one or more nurses as is practical for the number of babies and the subdivisions in that group.

Before beginning their period of training on the maternity floor all nurses should be carefully examined for lesions or conditions likely to incite such an infection. It should be made compulsory for any nurse to report any suspicious lesions on themselves as soon as noticed, and to remain away from the maternity floor until such condition is pronounced safe by a staff doctor. Caressing and kissing their charges, a practice which, although a great temptation, is too general among the nursery nurses, should be condemned. demned.

The nursery nurses should remove their gowns when they have finished with their charges and leave the nursery. When taking the babies to and from breast a gown should be worn which is to be replaced, before again coming for the babies, by a clean sterile gown. Nursery nurses should not visit out of the nursery in the same gown that is worn during the discharge of their duties.

There are many different routines for baby care in various hospitals. Some hospitals use olive oil for cleansing, but more hospitals are changing from this and using soap and water baths, either as a spray bath, or in individual bath tubs which are sterilized each day.

At the Minneapolis General Hospital, immediately after the delivery, the babe is taken to the nursery and given an olive oil bath. In the morning it is given a bath with water alone. Afterwards the baby gets its routine daily bath with a special soap made up by the hospital pharmacist. Suspicious cases are isolated and, with the mother, put under care of a separate nurse. A recent epidemic was shortened by daily sponging of all babies after their bath with saturated boric solution, and dusting with a powder composed of calomel and zinc oxide, each one part, and talc three parts. During this process the mouth and nose of the baby are covered with a gauze mask to prevent aspiration. At the University Hospital the baby after delivery remains untouched for six hours, then is given a spray bath using castile soap. Neither of these hospitals reports much unpleasant experience with this disease.

Keho reports the use of 1 per cent copper oleate in olive oil to remove the vernix. Kellert advises sponging after each bath with 50 per cent glycerine solution, which is supposed to exert an inhibitory influence on bacterial growth.

Collins suggests a daily bath with a weak solution of potassium permanganate, but this drug has the disadvantage of its staining qualities. Reed reports a series of cases after the injection of immunogen, made from staphylococcus aureus and albus cultures. Of forty-six cases injected during an epidemic, 80 per cent remained free from lesions; of twenty-seven cases not injected 80 per cent developed pustules.

There are several methods of treating this infection, and each has its advocates. The base of the lesions should be painted with some caustic solution such as 5 per cent copper sulphate or 5 per cent silver nitrate, only once, followed with continued application of some ointment such as copper oleate, 1–2 per cent, or ammoniated mercury 2–5 per cent. Stronger concentrations are too irritating and are no more efficacious. Holder advocates painting the region of the lesion with 2 per cent aqueous gentian violet, breaking the bleb and painting the base of the lesion with the same reagent.

In the past, at this hospital, immediately after delivery and daily, the baby was cleansed with sterile mazola oil. Recently that routine has been changed so that on the third day post-partum daily bathing with soap and water is instituted. If the baby develops suspicious lesions it is isolated under care of a separate nurse, but the mother remains under the regular nursing regime.

In a review of the obstetric charts for 1929, of 517 babies, twenty developed lesions of pemphigus or impetigo. The average time of appearance was five to seven days post partum. None of these cases were accompanied by any constitutional manifestations. The infection was still active at the time of the babies' discharge from the hospital. Sixteen babies developed purulent conjunctivitis, some of whom also had impetigo lesions. No cultures were taken, so the causative organism cannot be stated. Seven babies had lesions suspicious of pemphigus and were isolated, with no developments. All but two of these cases developed in November and December. Despite all efforts to eradicate it, this epidemic continued through May of this year. No explanation was found for the source, but since then, except for a few cases with several pinhead pustules from which staphylococcus albus was cultured, there have been no cases of impetigo.

In September of this year two cases with punctate pustular lesions appeared on the fifth day post partum. From these we cultured staphylococcus albus. Shortly after, two cases of frank impetigo developed. One appeared on the seventh day with one large pus-filled bullous on the left thumb, one on the right forefinger and several smaller lesions on the palms. The second baby developed lesions of the face, back of the neck, axilla and groin on the fifty day post partum. Cultures were made on blood agar hoping to find the streptococcus or staphylococcus aureus, but only staphylococcus albus was found. This indicates that further bacteriological study is needed to establish the relationship of the albus type of staphylococcus to this disease. This organism is the one most commonly found on our bodies, and, for that matter, in our general surroundings. Either there is a variation in virulence among the albus group or there is a variation in the defence reaction to its invasion.

The last case mentioned was treated with 50 per cent glycerine sponges after the bath, 1 per cent mercurochrome and 2 per cent ammoniated mercury ointment to the lesions, dusting with Mulford's preparation of bismuth-formie-iodide powder and general ultra violet ray administration. The results were very satisfactory.

SUMMARY

There is some distinction between impetigo and pemphigus from a bacteriological and pathological standpoint, but from the viewpoint of epidemiology they may be regarded as the same.

The mother is an important factor from an etiological standpoint in the transmission of this infection.

Group nursing, with individualization, as far as practical, is necessary in the nursery.

The institution of a prophylactic regime is important when the infection first appears in the nursery.

The nursery linen should be cared for in a separate laundry.

The vernix should be removed with copper oleate (1 per cent) or ammoniated mercury (2 per cent) in olive oil immediately and followed with routine daily bathing with mild soap and water.

An attitude of concealment is not a scientific one and combats any progress in determining the facts about this disease.

BIBLIOGRAPHY

1. Jordan:
   a. Trans. Am. Hosp. Assn. for 1928, p. 552.
   b. Bull. Am. Hosp. Assn., Jan., 1930.
2. Sexton: Trans. Am. Hosp. Assn., 1928, p. 556.
3. Rulison: Jour. Am. Med. Assn. (Sept.), 1929, p. 903.
4. Kellert: Am. Jour. Obst. and Gyn. (Sept.), 1929, p. 426.
5. Seeds: Virginia Med. Month. (Nov.), 1929, p. 530.
6. Ellison: Lancet, 1:1343, 1927.
7. Kohler: Indianapolis Med. Jour., 32:334 (June), 1929.
8. Reed: Am. Jour. Obst. and Gyn., 17:49 (Jan.), 1929.
9. Benians: Lancet, 1:174 (Jan. 26), 1929.
10. Keho: Northwest Med., 28:37 (Jan.), 1929.
11. Collins: Lancet, 1:227 (Feb. 2), 1929.
12. Baldwin: Am. Jour. Obst. & Gyn., 19:93 (Jan.), 1930.
13. Holder: Am. Jour. Obst. and Gyn., 15:857, 1928.

PROGNOSIS IN HEART DISEASE*

FREDRICK A. WILLIUS, M.D.
Rochester, Minnesota

ALMOST daily, some patient or his relative, or some physician, attempts to impose on the clinician the function of soothsayer. Most clinicians, I believe, strongly resent the implication.

Therefore, in arriving at a prognosis, disease should be analyzed in relation to its inception, its course, and its termination, in the light of symptoms and signs. Experience will permit application of quantitative values whenever they are possible, but it should impose the obligation to apply these values by the act of judgment.

It must ever be borne in mind that the art of medicine and the science of medicine are not synonymous terms that the sound clinician must possess the virtues of both. This is particularly true in cardiology, and the significance of individualization of patients cannot be over-emphasized, not only from the standpoint of prognosis but also from the standpoint of treatment.

Prognosis is not possible until the diagnosis of the disease has been accurately established. In addition to identification of the disease, it is necessary to obtain additional information with reference to factors and conditions that may influence not only the course of a given disease in general but also its course in an individual patient. Experience, recorded in the form of statistical data, gives valuable information. If data are completely recorded, and are sufficiently comprehensive in scope, they yield knowledge of what may be called the life cycle of disease. Such study of a disease necessarily deals with etiology, age of onset, course and duration, cause of death and age at death. The values obtained from a study of this nature are important, but they represent group ratios, and judgment is necessary in applying these values to the individual patient. The group is comprised of many individuals, who as individuals are in no way comparable, and would not be comparable even under conditions of normal health.

The obvious factors that may influence the life expectancy of a patient with heart disease are age, sex, heredity, occupation, etiology, type of lesion, mode of living, environment and intercurrent infections:

AGE

The time of life at which heart disease affects the patient as evidenced by the onset of symptoms, in relation to the time at which the etiologic factors entered, if this can be determined, has an important bearing on prognosis. Cardiac infections, for instance, are notoriously prevalent in younger persons, and are largely limited to the first three decades of life, when rheumatic fever, chorea, tonsillitis, and the acute exanthematic disorders are common. In the middle and later decades of life, a great number of patients have myocardial disease, such as results from hypertension, arteriosclerosis and hyperthyroidism. Syphilitic cardiovascular disease is most frequently encountered in the fourth and fifth decades, owing to the fact that about twenty years elapse from the time of the primary infection until the occurrence of symptoms and signs of circulatory disease.

The interval which elapses between the initial cardiac insult and the careful examination of the patient together with the institution of a correct, individualized remedial regimen are vital factors in determining the patient's expectation of life. In cardiology, as in many branches of medicine, early recognition and proper management of the disease are of unusual significance.

SEX

In an analysis of 4,059 cases of organic cardiac disease noted in The Mayo Clinic, the sex incidence was found to be equal. The general impression exists that heart disease is more prevalent in men than in women. This unquestionably is true in certain localities, in different kinds of practice, and in some forms of heart disease.

In a study of the influence of sex on the course of heart disease it was found that the average life expectancy of women is greater than that of men. This is undoubtedly due to the fact that women, as a group, are subjected less to occupational stress than are men, and that they more rapidly and completely adapt themselves to their physical handicap. It is interesting to speculate whether this observation will survive in the succeeding generations, owing to the fact that the so-called feminine emancipation and the World War has placed many women in arduous occupations previously held only by men. The influence of childbearing on women as a group unquestionably counterbalances the greater life expectancy to some extent. Infectious cardiac disease and hyperthyroidism are more prevalent in women, whereas hypertension, coronary disease, and syphilis are more prevalent among men.

---

*Submitted for publication November 3, 1930. From the section on Cardiology, The Mayo Clinic, Rochester, Minnesota.

HEREDITY

There has been considerable skepticism regarding the part heredity plays in the propagation of cardiovascular disease. Notwithstanding this skepticism, one who is in constant contact with patients who have these diseases becomes more and more impressed with the significance of the influence of heredity. I do not intend to imply that I believe that the disease itself is transmitted, but I am convinced that the tendency for the ultimate acquisition of cardiovascular disease is a heritage. I realize that the word tendency is used in a rather abstract manner, but its application here denotes the transmission of cardiovascular structures that lack the average qualities of resistance to the stresses and strains usual in an average life. The intermarriage of persons in whom cardiovascular disease may be present in one or in both, ultimately reflects the influence of the disease on their progeny, according to the law of Mendel. The detrimental influence is frequently carried further by subsequent intermarriages of descendants with others suffering from cardiovascular disease or descending from families in which such diseases are prevalent.

At this time, the average expectation of life in the United States is assumed to be about sixty-five years. This presupposes that the average cardiovascular system, regardless of the ultimate cause of death, is so constructed that it will continue to function when subjected to the ordinary stresses and strains of life for an average period of sixty-five years. In contrast to this are those persons in whom the heart, arteries and kidneys fail at a much earlier age. This is particularly true of patients who have hypertension, coronary sclerosis and the forms of arterial degeneration associated with such conditions. The part heredity plays in the obviously acquired diseases such as those resulting from infections, and so forth, undoubtedly is minimal.

A physician can readily convince himself regarding the rôle of heredity in connection with this disease by carefully inquiring into the causes of death in the patient's immediate and remote family. A striking example of the part heredity plays may be noted in the history of a patient who recently came under my observation. The patient was a man, thirty-six years of age, who presented himself for examination owing to the existence of severe cardiac failure. Analysis of this history was very interesting because it revealed that the paternal grandfather, the first member of the line in which the cause of death was known, died of apoplexy at the rather advanced age of seventy-two, seven years beyond the present accepted average, whereas the father, the representative of the succeeding generation, did not fare so well, and died of angina pectoris at the age of fifty-four years, nine years below the accepted average. The representative of the third generation, the patient, was a cripple from cardiovascular disease at the early age of thirty-six years, with a probable life expectancy of less than a year.

It is only reasonable to suppose that a structure, as important and as dynamic as the cardiovascular system, would have difficulty in surviving the stress and abuse to which it is subjected, even under ordinary conditions of existence, if its fundamental, endowed qualities are inferior. Physicians daily see patients who are identified as constitutionally inferior; yet these physicians seem to find it difficult to realize that this inferiority may not be generalized, but may be limited to various systems of the body.

OCCUPATION

Occupation is a vital factor in prognosis, and patients afflicted with heart disease, whose daily routine subjects them to strenuous physical stresses and strains, do not, as a rule, have a life expectancy comparable to that of other people performing lighter, more moderate duties. Whenever possible, it is desirable for patients suffering from heart disease to obtain sedentary employment, and the responsibility for such advice lies with the physician.

Another factor of significance is involved when advising changes. For instance, when the patients are operators of public vehicles, sudden death from acute heart failure would endanger the lives of many persons. The classification in this group would include railroad engineers, bus drivers, chauffeurs, aviators, and so forth.

It is becoming increasingly difficult for patients engaged in strenuous occupations to obtain sedentary employment. The extensive employment of women in business, in clerical lines as well as in industrial capacities, has created an enormous shortage of sedentary positions, so far as men are concerned. Many of the larger business and industrial organizations give preference to normal persons through the selective medium of physical examination, thereby further decreasing the chances of the person with cardiac disability to be self-supporting in occupations that are commensurate with his abilities.

Many of the larger cities, through public health agencies and welfare organizations, have become engaged in the problem of placing people with chronic heart disease in occupations suitable to their disability, and much has been accomplished already.

ETIOLOGY AND TYPE OF LESION

Life expectancy in the person with cardiac disease is largely dependent on the degree and extent of the injury to the cardiac musculature, and on the rate of progress of the pathologic process. Experience has shown that the mortality differs widely in various forms of heart disease. Prognosis depends mainly on the etiologic factor. In cases of diffuse myocardial disease, as exemplified by coronary and hypertensive heart disease, as a group the morbidity is highest, owing to the fact that, as a rule, these forms of disease occur in older persons, that the cardiac lesion so frequently is only a part of a more or less generalized pathologic process, and that the underlying disease tends to be progressive.

Endocardial valvular disease.—Chronic endocarditis, as emphasized in a previous paper, is the result of rheumatic fever or chorea. The prognosis in the initial attack or in the acute stage of the disease usually is good. Death rarely occurs except from associated or intercurrent disease. The ultimate outlook in endocarditis depends, in large measure, on the extent of the cardiac injury, that is, on the degree of associated myocardial and pericardial involvement, and on the care exercised in the subsequent management of the patient. As a group, death of persons with mitral disease occurs earlier than that of persons with aortic disease. When aortic and mitral disease coexist, the mortality averages approach those of mitral disease.

Acute bacterial endocarditis, which is usually the result of infection from *Streptococcus hemolyticus, Diplococcus pneumoniæ* (pneumococcus), staphylococcus and *Neisseria gonorrhea* (gonococcus) invariably is fatal within a period of from three to five weeks. As a rule, it is only an incident in a generalized infectious process.

Subacute bacterial endocarditis is probably always fatal. In a group of patients seen at The Mayo Clinic, none has recovered. Recoveries have been reported but, in view of more recent knowledge, the validity of the diagnosis in such cases is doubtful. It is now recognized that, from time to time, nonhemolytic streptococci are recovered from the blood stream of patients ill with rheumatic fever or with subsequent exacerbations of the disease. Under such conditions, recovery of bacteria by blood culture would probably indicate the presence of acute rheumatic endocarditis, and not the presence of the disease known as subacute bacterial endocarditis.

The average course of subacute bacterial endocarditis is eleven months; death occurs from gross visceral infarction, uremia, and the progressive inanition of infection and anemia.

Myocarditis.—As already stated, myocarditis, in the correct use of the term, exclusive of its occurrence in valvular disease, is a relatively rare condition, notwithstanding the frequency of such diagnosis. The prognosis here depends largely on the degree and extent of the injury to the muscle of the heart, and on the virulence and the persistence of the infecting organism. I have observed a small group of cases in which focal myocarditis occurred in the course of acute and subacute infectious arthritis, and in which there was an early and high mortality from the cardiac lesion. These cases represent diffuse myocardial disease; the focal areas often are confluent, and result in serious impairment of the function of the heart.

Pericarditis.—The significance of pericarditis depends chiefly on the infecting organism, its virulence, and the degree and extent of injury not only to the pericardium, but also to the other cardiac structures. Pericarditis may be classified as follows: (1) fibrinous, (2) rheumatic, (3) purulent, (4) adherent, and (5) tuberculous.

As a rule, the cardiac handicap resulting from simple fibrinous pericarditis is small and the prognosis is good unless the inflammatory process is recurrent and results in deformity. When effusion occurs, the seriousness of the condition is dependent on the quantity of fluid formed, its rate of formation, recognition of its presence, its removal before serious cardiovascular embarrassment occurs, and the type and virulence of the infecting microörganism.

The pericarditis of rheumatic fever is invariably only a part of the pancarditis, and, as a result of the extensive, associated cardiac injury is ultimately attended by a high mortality rate.

Purulent pericarditis frequently is rapidly fatal, as often it is but a manifestation of a severe, generalized infection. It may, however, arise by extension from a contiguous focus of suppuration, such as empyema within the thorax.

The prognosis in adherent pericarditis depends almost entirely on the degree of mechanical interference to which the heart is subjected, and to the rate at which the barriers develop. The process usually is insidious in its development, the heart responds gradually by hypertrophy, and functional adequacy is frequently maintained for many years.

Tuberculous pericarditis is essentially of two types, namely, the primary, in which the infection arises primarily in the pericardium, and the secondary, in which the invasion of the pericardium occurs from contiguous intrathoracic lesions of tuberculosis. The latter type is by far the more common, and unless the involvement is very extensive and unless secondary suppurative infection occurs, the prognosis is reasonably good. Under average conditions, it may be compared to the condition of pleural tuberculosis. However, the prognosis of primary tuberculous pericarditis is unfavorable, particularly when recurrent effusion occurs; the effusion frequently occurs in enormous quantities and is prone to accumulate very rapidly. Frequently, a fatal complication is extensive venous thrombosis involving the brachial vessels, undoubtedly in part the result of pressure and stasis.

Cardiovascular syphilis.—Early recognition and proper treatment are of primary importance in the prognosis of cadiovascular syphilis. In the early stage the lesion is limited to the outer layer of the aorta, gaining entrance by way of the small lymphatic vessels which accompany the vasa vasorum, and causing peri-aortitis. When invasion of the media and intima occurs, the process is often beyond control. As the inflammatory reaction of syphilis is productive, it soon leads to reparative fibrosis, producing deformities which have a profound influence on the cardiovascular mechanism. Of note among these cicatricial changes are those which involve the aortic valve leaflets and ring, causing aortic insufficiency, and those which produce atresia of the coronary orifice, thereby hampering the nutrition of the heart. It is probable that actual myocardial changes have occurred in all moderately advanced and advanced cases. The changes are hypertrophy in the case of aortic insufficiency, and myofibrosis in the case of atresia of the coronary orifice. Two fundamental lines of thought are advanced today with regard to cardiovascular syphilis. The first ascribes the failure of the muscle of the heart that ultimately occurs to purely mechanical effects, already discussed, and the second ascribes this failure to the actual existence of syphilitic myocarditis. The latter point of view has been supported by the occasional demonstration of spirochetes in the myocardium, although it is difficult to reconcile this idea with clinical and pathologic facts. The presence of gummas in the myocardium is a different matter, and irrevocably establishes the diagnosis of syphilitic myocarditis. Until evidence is offered which will lead to other conclusions the mechanical theory of myocardial injury must be generally accepted.

The prognosis in the early stage of cardiovascular syphilis is reasonably favorable, provided adequate and persistent treatment is instituted early. In the later stages, the outlook is uniformly grave, as progressive cardiac failure invariably occurs, even in spite of rigid treatment. Intensive treatment in the moderately advanced and advanced cases usually hurries the course of the disease, and may prove fatal soon after it is instituted. Such treatment should be avoided at all times.

The onset of congestive failure of the heart is the beginning of the end, in my experience; only two patients in the series seen at the clinic lived more than a year after its onset.

Diffuse, noninfectious myocardial disease.—Coronary sclerosis is one of the most important problems in cardiology at present. Angina pectoris occurs in about a third of the subjects, and undoubtedly represents the most serious form of the disease.

The early manifestations of the anginal syndrome are too often considered insignificant by the physician because the objective examination of the heart reveals little or no evidence of organic disease, and therefore the patient is permitted to carry on his usual work. The onset of retrosternal pain or discomfort and the occurrence of nocturnal dyspnea, particularly in patients of middle or later life, should always be considered an ominous sign until positively proved otherwise. The fact that the pain, origin and distribution are often atypical requires a knowledge of these possibilities in evaluating the condition of a patient whose complaints are not typical. John Hay very impressively expressed himself in the following words: "Prognosis is often at fault because the significance of the slight and early manifestations is misinterpreted. These minor anginas have certain characteristics which should enable them to be recognized for what they are, symptoms often unobtrusive, yet significant, and only yielding up their secret to careful cross-examination. They may be compared to a gesture, slight but ominous, and full of menace."

Acute occlusion of a coronary branch by embolism or thrombosis is one of the most serious catastrophes in cardiology, and it may occur in any case of coronary disease, even though the changes in the aorta are minimal. The immediate mortality is exceedingly high; at least half of the patients die at once or within a few hours. Those who survive the immediate attack may live for from several months to five or six years; death ultimately occurs from progressive myocardial failure or recurrent cardiac infarction.

Hypertensive heart disease.—The chief effect of hypertension on the heart is to cause myocardial hypertrophy, particularly of the left ventricle, due to increased work. As hypertrophy increases and dilatation supervenes, impairment of function occurs, which is manifested as heart failure. Associated coronary changes, as previously emphasized, modify the disease.

It is not always possible to foretell the manner in which a patient with hypertension will die. However, statistical study has shown that when the cardiac phase of the disease dominates, death usually occurs from heart failure. Prognosis in the individual case is extremely difficult; a serious prognosis given at the time of examination greatly embarrasses the physician if, several years later, he meets the patient, who appears to be still in fairly good condition. The onset of congestive failure usually warrants a grave estimate of the outcome, and the evident association of coronary disease obviously diminishes the expectation of life.

The heart in goiter.—The heart both in exophthalmic goiter and in hyperfunctioning adenomatous goiter is subjected to increased work as a result of the elevation of the basal metabolic rate. Irreparable cardiac injury in both diseases is unusual unless the course has been allowed to become protracted. The favorable prognosis that usually can be given in such cases is attributable to the fact that the disease of the thyroid gland is amenable to cure by operation.

MODE OF LIFE AND ENVIRONMENT

The patient's mode of life is molded by many influences; chief of these are his temperament, the habits he has developed, his financial status, which governs to a large extent the comforts and protections of life, his recreations, and so forth. Temperament is a very important consideration in heart disease, and is to a large degree a heritage. The intensive, dynamic, irrepressible person is an unfavorable subject to abide rigidly by the regimen prescribed, whereas his opposite, the phlegmatic, comfortable patient, readily adapts himself to such changes.

PHYSICAL SIGNS

The condition of the heart as elicited by careful physical examination gives very significant data regarding prognosis. The degree of efficiency and integrity of the heart invaded by disease is directly dependent on the condition of the myocardium. The size of the heart is an important prognostic sign, as marked enlargement, particularly when dilatation exceeds hypertrophy, frequently ushers in severe heart failure and death.

Murmurs are important signs in the diagnosis of the type of lesion, but do not deserve the emphasis they have received in the past. Not so long ago the presence of a murmur was considered a sufficient reason, regardless of the character, time, or situation, for diagnosing organic disease of the heart. Murmurs are frequently evanescent, particularly those accompanying increases in rate of circulation such as occur in anemia, hyperthyroidism and pyrexia.

The murmurs that are now recognized as being of greatest significance are those of mitral stenosis and aortic insufficiency. Prognosis does not depend on the murmur itself, but on the fact that the murmur in question indicates a valvular lesion, and the outlook is governed by the condition of the myocardium as influenced by the valvular lesion.

Gallop rhythm and heart tones that are distant and lack definition and differentiation are important signs, for they indicate a marked degree of myocardial fatigue.

Cardiac arrythmia of itself does not necessarily increase the seriousness of the prognosis, but it often occurs when heart disease is well advanced. This is true of auricular fibrillation, one of the most common and significant disorders of rhythm.

Premature contractions do not affect prognosis except as they occur in conjunction with serious disease of the heart. They are common in perfectly normal hearts. Pulsus alternans is always a very grave prognostic sign, usually is soon followed by death, and is indicative of marked impairment of cardiac function.

The prognosis with complete heart-block is, as a rule, unfavorable, particularly when associated with attacks of the Stokes-Adams type. The fact that most of these conditions are the result of coronary disease implies the existence of a pathologic process that is progressive in nature. Any disorder that may profoundly affect the brain, such as occurs during the Stokes-Adams seizures, is dangerous and may result in sudden death.

The prognosis of paroxysmal tachycardia depends chiefly on the type of tachycardia, and on whether or not associated organic cardiac disease exists. When associated heart disease is present, the prognosis is largely that of the underlying cardiac disease.

Electrocardiographic studies have revealed data of great prognostic significance not determinable by other means. This is particularly true of significant T wave negativity and bundle branch block. These facts, if no others could be found, would justify the use of the electrocardiograph in clinical medicine.

INTERCURRENT INFECTIONS

Intercurrent infections, either acute infections, episodes of one form or another, or foci of chronic infection, which exert influence during the course of cardiovascular disease, have unfavorable influences. Little usually can be done to avoid the acute infectious diseases, but evident foci of infection may be eradicated. The chief indication for this procedure is in the early stage of the disease, and not when the disease is so advanced that no reasonable chance for even temporary improvement exists.

Little is known regarding the etiology of arterial degeneration, and it is not beyond reasonable speculation that infection may play a vital part. It is therefore probably correct to eradicate foci even before the advent of actual disease.

TREATMENT

Prognosis in a large majority of cases is dependent on the adequate management of the patient. This must always be made an individual problem, for the cardiac status of similar types of disease varies greatly. There is little question but that the life expectancy of many patients can be distinctly increased by the institution and the maintenance of a proper regimen. This is not fully appreciated, and only too often little attention is given to a patient after he has temporarily recovered from an acute attack of cardiac failure.

FUNCTIONAL DISORDERS OF THE BOWEL*

R. S. Ylvisaker, M.D.
Fergus Falls, Minnesota

IT IS with a great deal of wholesome respect that one attempts the presentation of such a subject as this—functional disorders of the bowel. This attitude has as its chief source, perhaps, the gradually increasing mass of good literature on the subject which has appeared within the past few years. Certainly, after reading some of this literature, one is tempted to feel that, in our present knowledge, everything has been written on the subject that can be written. However, one's respect is not lessened either by the fact that probably more than 50 per cent of the patients who consult the average practitioner have as their main complaint symptoms to which no other label can be attached than that of a functional disorder of the bowel. Nor is this respect diminished by the fact that the functional gastrointestinal patient is usually the neurotic patient whose story is a long one, never repeated twice in the same way, and whose symptoms are multiple and vague.

The problem of the functional gastrointestinal patient is a difficult one, for it must be remembered that his complaints are as real as, and in some cases more severe than, those of a patient with far advanced carcinoma of the stomach. On the other hand, there is no more grateful patient than the functional patient who has found relief, or, in some cases, who has found only a satisfactory explanation for his symptoms. Thus, in many cases, at least, it will be found that the hours spent in carefully questioning, in thoroughly examining, in observing and finally in explaining the condition to, and reeducating such a patient are well worth while.

It is, of course, not the purpose of this paper to try to cover the entire field of functional bowel disorders. I shall try only to bring out a few points which I regard as important especially in regard to treatment.

As an introduction I would like to call attention to certain facts in the physiology of the intestinal tract. We are here concerned primarily with the physiology of the movements of the intestines and only secondarily with the process of digestion and absorption. In the small intestine there are three types of movement—the rhythmic segmentation movements which are localized rhythmic contractions of the circular muscle which knead the intestinal contents and spread them over the intestinal surface; the pendulum movements which are swaying movements in which the contents of a short loop of intestine are thrown from one end to the other; and lastly the peristaltic rushes—larger waves which may start anywhere in the small intestine and go short or long distances down the bowel. The latter usually start in the duodenum and usually go no farther than the ileo-cecal valve, but occasionally they continue on down the colon. Normally we do not feel these, but in disease conditions, especially diarrhea, they may be evidenced by "queer feelings, breaking out of sweats and fainting at the toilet" (Alvarez). Also, in exhausted and nervous conditions, we may become conscious of these waves. The colon has normally very sluggish movements. There is very little peristaltic activity. The material from the ileum is pushed into the cecum and ascending colon merely by the pressure of the material coming after it. From here the fecal material is transported to the pelvic colon by so-called mass movements. These occur only a few times a day—usually on arising in the morning and during or after each meal. When the pelvic colon becomes filled, the next mass movement carries the contents on into the rectum. This gives rise to the desire to defecate. In most people this occurs once daily, usually in the morning on arising or after breakfast, but this is by no means constant. The tonus of the circular muscle of the colon appears to act as a resistance to the mass movements.

There are two theories as to the origin of these muscular movements of the intestine. The older theory of Bayliss and Starling stated that they were chiefly the result of nervous impulses —the neurogenic theory. Recent work has tended to disprove this theory and show that the smooth muscle of the intestine has an inherent property of contracting rythmically, in fact that it may be entirely autonomic, the nervous mechanism acting merely as a regulator so that the various parts of the intestine may work in harmony. Alvarez has advanced his "gradient idea." According to this there is a gradual decrease in the inherent muscular activity and irritability and certain other factors from the duodenum on to the rectum. This, he says, accounts for the downward passage of food along the intestinal canal. An increase in the irritability at any point in the intestine may upset the downward gradient and disturb the passage of food along the intestine. Local spastic contraction may also be produced. This increase in irritability can be brought about by local irritation —by inflammations, by irritating foods and chemical poisons, and by nervous influences. It can be seen that this could result either in a diarrhea, or, if the spastic contractions are constant and prolonged, in an actual obstruction and thereby constipation. The fundamental process in either case is the same.

---

*Read before the annual meeting of the Northern Minnesota Medical Association, Moorhead, Minnesota, September 20, 1930.

As regards the physiology of digestion and absorption, there is one factor which seems to me to be important. Recent measurements of the length of the bowel in living human beings tend to show that previous measurements made on cadavers were much too long. In fact, it now seems proven that the intestine of man approaches very nearly those seen in carnivorous animals in which the length of the bowel is only from four to eight times the body length. In herbivorous animals the bowel length rises to from twenty-five to one hundred times the body length. In this connection it is interesting to note the observation made by Stefansson in his stay among the Eskimos. He found that these people have practically only fatty meats for food. In order to learn more about the effect of such a diet, Stefansson himself lived on an exclusive meat diet for two years, eating also, of course, the fat that came with the meat. He makes the statement that once he had become accustomed to his new diet he felt much better than he had before. Starling has the following further consideration to offer: "There is no doubt that many of the disorders of middle life may be put down to over-feeding and lack of muscular exercise, but there is just as much reason to ascribe these evils to the carbohydrates as to the proteins of the diet. Indeed, it has been found that for men leading a sedentary life a moderate protein and fat diet is more suitable than one consisting chiefly of carbohydrates. In this case the normal stimulation to oxidation of the foodstuffs, viz., muscular exercise, is absent, and the stimulating effect of proteins on metabolism, their specific dynamic action, useless when muscular work has to be performed, is under these conditions a real value to the organism." Farther on he states, "Overloading the intestines with carbohydrates in many individuals leads to abnormal fermentation, the production of gases, and general discomfort."

Time does not permit us to discuss the symptomatology and diagnosis of functional disorders of the bowel, but a few statements should be made in regard to diagnosis. Let me repeat here that the vague symptoms of nervous indigestion usually require a much more careful analysis than the definite symptoms of organic pathology. There are some patients in whom a diagnosis of a functional type of disorder can be made with a fair degree of certainty almost as soon as the patient begins to talk. Even these individuals require a careful examination if for no other purpose than to convince them that there is no organic disease present and that the condition is not a serious one. It must be remembered, too, that the neurotic patient can develop organic pathology. A very interesting case will serve to illustrate this. A man in the late fifties complained of a constant, dull pain in the midepigastrium which radiated straight through to the back. This had been present several months and had grown steadily worse. There was no relation to the taking of food nor to bowel movements. There had been some loss of strength. His previous health had been good and there were no other symptoms. The physical examination and laboratory and X-ray examinations were entirely normal except for a constant deformity of the duodenum with the barium meal. This certainly did not go with his type of distress. He was sent to the hospital for observation. During the period of observation the nurse in attendance complained repeatedly about the marked neurotic tendencies of the patient. Most of the day he would lie quietly in bed, but as soon as someone entered the room he would assume the position of one who was "doubled up" with pain. His conversation revolved almost entirely about his ailment. However because of the history of a recent onset in a man past middle life, the loss of strength, the duodenal deformity with no relief from careful ulcer management, an exploratory laparotomy was decided upon. An inoperable carcinoma of the pancreas was found.

As we come to the treatment of functional bowel disorders we look first for a classification to guide us. To classify these disturbances is, of course, not easy. Alvarez lists the functional types of indigestion according to the etiology and the outstanding symptoms as follows:

1. Fatigue neurosis.
2. Temperamental indigestion.
3. Anxiety neurosis.
4. Marital infelicity.
5. Nervous vomiting.
6. Psychopathy.
7. Constitutional inadequacy and asthenia.
8. Hypovarianism.
9. Enteroptosis (he no longer thinks that this causes symptoms).
10. Migraine.
11. Mucous colitis.
12. Intestinal allergy.
13. Constipation.
14. Flatulence.
15. Diarrhea.

This is probably the best grouping that we have to go by in arriving at the fundamental mental or emotional conflict and physical background at work in any individual case. It has struck me, however, that patients seeking relief for these functional disturbances fall rather naturally into a few larger classes somewhat as follows:

1. Those with constipation without other symptoms.
2. Those with symptoms which are due to the overuse of cathartics.
3. The high strung, nervous type, usually with a comparatively high degree of intelligence.
4. The weak-backed, asthenic, visceroptotic girl whose chief trouble is a general constitutional inadequacy and whose intelligence is usually somewhat below par.
5. The overweight individual of middle age or over with symptoms due to excess fermentation of starches.
6. The definitely psychopathic individual.

It is admitted that this classification is not all-inclusive. There is also considerable overlapping of the groups in many cases. But I think that the types pictured in each group will serve as fairly good models in treating most of the functional bowel cases who present themselves to the average practitioner. It should be repeated here that in those cases in which there is a mental or emotional conflict at the bottom of the trouble no good can be accomplished until that conflict has been settled.

Group 1.—The patients who come in complaining of constipation alone are comparatively rare. Now that the medical profession is coming to be properly educated in managing this type of case, it would be fortunate if more people would seek advice concerning this so that we might gradually re-educate people and undo the evil that has for years been done, not only in prescribing, but also in allowing people to use laxatives indiscriminately. Active propaganda is necessary in this respect. Provided organic obstruction to the bowel has been ruled out, and minor lesions about the anal canal have been treated, the best and simplest advice to give these patients is not to meddle, but allow nature to take care of itself. It should be explained to them that there is a great variation among people in the frequency with which they must empty their bowel. Some people can go three, four and five days without a bowel movement and feel no ill effects. They should be instructed, however, to yield promptly to the desire to defecate. Other than this, they should forget that they have a bowel.

Group 2.—The patients in this group may also complain only of constipation. Further questioning will bring out the history of the frequent use of cathartics and coarse foods and the presence of a certain amount of abdominal distress. These patients show the symptoms and findings of the "spastic" or "irritable" bowel in its simplest form. Their symptoms vary usually according to the length of time they have been subject to the cathartic habit. There may be only mild griping pains after the taking of laxatives. On the other hand, the patient may complain of many symptoms, including pain, which may be localized anywhere along the course of the colon and which is usually described as cramps or gas pains, burning pain in the epigastrium, fullness in the epigastrium, queer feelings often described as "an all gone feeling," the desire to defecate when the rectum is empty, passage of small quantities of mucus in the stool, flatulence, loss of appetite, nausea, vomiting, and sometimes general symptoms such as headache, dizziness and lassitude. The characteristic feature about the abdominal symptoms is their relationship to defecation. A good bowel movement usually relieves some or all of the symptoms temporarily. The treatment depends on the severity of the symptoms. Mild symptoms will usually be relieved as soon as the irritant laxative or food has been stopped, provided the condition has been explained to the patient and the fallacy of the use of laxatives and coarse foods pointed out. Patients with moderately severe symptoms will require more careful management. They should be given a bland, low residue diet. If possible, they should rest for an hour after each meal with a hot water bottle to the abdomen. If the bowels do not move for two or three days, a small quantity—2 ounces—of olive oil may be injected into the rectum at bedtime to be retained over night. An attempt should be made to move the bowels the next morning. If this is unsuccessful, a half pint of plain tap water or physiologic saline solution may be injected to start the bowel movement. Antispasmodic drugs are often helpful, such as the calcium salts—pure grades of calcium carbonate and calcium phosphate. If pain is prominent, small doses of extract of belladonna may be added to the calcium salts. During the course of treatment, the physician should frequently observe the character of the stools at the same time as he is taking his patient's mind off this subject as much as possible. It should be remembered that a small, hard, marble-like stool has the same significance as a mushy or liquid stool, indicating an overactive or spastic bowel. Severe cases should be treated the same as a severe diarrhea, put to bed, started out on scalded milk and hot gruels every two hours, hot wet packs to the abdomen every alternate hour and it may be necessary to add bismuth and larger doses of belladonna or opium to quiet the bowel. As the condition of the patient and the character of the stool improves, bland foods should be added and the patient soon put on the more moderate management previously outlined. It is necessary to warn the patient that some time may be needed in readjusting the bowel and to reassure him that no harm is done by the small, infrequent, hard stools.

Group 3.—This group includes many of the hardest working and most keenly intelligent people that we meet. Their chief trouble is that they drive on and on carrying the burden and doing the work of several average people until finally they crack under the strain. Once we are able to "get under their skin," allow for some of their eccentricities and explain to their satisfaction the cause of their present condition, they become some of our most pleasant patients. Their abdominal symptoms are essentially those of the irritable bowel with a tendency to be more vague than those listed in the cathartic habit group. In many, a chronic cathartic habit is superimposed. There may be constipation or diarrhea. The cases of so-called mucous colitis usually come under this group. In addition, there is the general nervous and muscular tension often resulting in insomnia and other difficulties. The main therapeutic indication is for rest, physical and mental, as far away from their pet worries as it is possible to get them. To begin with, sleep and relaxation should be induced by means of sedatives, the simpler ones like the three bromides and luminal being the best. These can later be tapered off as the patient improves. While the patient is on the rest cure, it will usually be necessary to treat his abdominal symptoms. This is best done by giving a bland diet and prescribing the other measures used in the treatment of the spastic bowel. The hot abdominal packs will be found especially useful in relaxing the tense patient and often is the main factor in inducing sleep. Light, general massage and ultraviolet radiation treatments are also beneficial in improving muscular tone and building up the patient's resistance.

Group 4.—There are many men as well as women who fall into this group, but we are best acquainted with the young lady mentioned so that she can be used as type. She is probably the most trying of our patients. Her symptoms are due mainly to such a lowering of her nervous threshold that most of the sensations which come in to her central nervous system are immediately referred out again to some organ or organs in the form of pain, hot and cold flushes, paresthesias and what not. Her symptoms are therefore varied and vague and not necessarily referred to the bowel although the mass of efferent nervous stimuli set free must certainly upset the downward gradient of forces in the bowel and produce conflicting muscular contractions and therefore intestinal symptoms. She is usually also below par physically and is therefore more subject than most of us to all human ailments. Not only that, but often she is somewhat lacking in mentality and so unable to cope with the problems of life. I recently saw just such a patient. On top of it all she was married to man twice her age and lived with her aged parents-in-law. It is not necessary for me to describe the result. In treating these people it is best to explain to the family at least that we cannot expect a cure. The most that we can hope to do is to try to build up their resistance and so ward off some of their physical ailments. Occasionally they can be educated to live fairly comfortably with their nervous troubles. In carrying out the treatment, it is probably best to put them to bed away from the family. The mass of nervous stimuli which bother them should be cut down as much as possible by means of sedatives and a bland diet. The latter should have a high caloric value and, to begin with, it may be necessary to force the feeding by having the nurse feed the patient. Ultra-violet radiation is important. In many cases small doses of thyroid extract are of value in speeding up the general metabolism.

Group 5.—The quotation from Starling previously cited characterizes this group well. The excessive fermentation of carbohydrates is, however, seen in others besides the overweight individual of middle age. In fact, in my opinion, the outstanding dietary sin of today is the excessive use of carbohydrate foods, and I believe that recent physiologic studies support this view. As the difficulty that these people have is an excessive fermentation of carbohydrates, their chief symptom is flatulence. In severe cases there has resulted also a considerable degree of bowel irritability with its symptoms. General symptoms such as headache, dizziness, nervous irritability and muscular weakness are common. The chief indication for treatment is the withdrawal of carbohydrate foods as far as possible. If the symptoms of bowel irritability are marked, the diet should at first have a low residue. Alvarez believes that the chief cause of excess fermentation is an excess of undigestible cellulose in the diet. Some fruits and vegetables may later be gradually added. The permanent diet should consist mainly of milk, cream, butter, eggs, meat, and fruits and vegetables. Potatoes, bread, and cereals should be used in moderation. Pastries, rich foods, preserves and hot breads should especially be avoided. A generous amount of daily exercise is necessary to help burn up the glucose as it is absorbed. Calcium salts greatly help the bowel irritability.

Group 6.—The group of definitely psychopathic individuals with abdominal symptoms may be a real diagnostic problem, and this is the only reason for including them here. Once the diagnosis is made, the only treatment is to turn them over to a competent psychiatrist. They bring out the importance of carefully going into the family history for a hereditary background for insanity and into the patient's previous history for evidences of peculiarities of conduct. If the diagnosis is missed, they come to be a real nemesis for the practitioner, as ordinary forms of treatment are worse than useless for their fixed notions.

SUMMARY

1. Attention is called to certain facts in the physiology of the movements of the intestines and of digestion and absorption of food. Particular emphasis is laid on the fact that certain influences may bring about an increase in irritability anywhere along the intestinal tract, resulting in either a diarrhea or a constipation, and also on the fact that recent physiological studies point to an error in the present day tendencies toward high carbohydrate diets.

2. The necessity for careful study of the so-called neurotic patient is brought out.

3. The classification of Alvarez is cited and a simplified classification is offered, based mainly on types of patients familiar to most practitioners. A brief outline of the management of each of the groups mentioned is given.

BIBLIOGRAPHY

Alvarez, W. C.: Am. Jour. Physiol., 88:650, 1929.
Alvarez, W. C.: The Mechanics of the Digestive Tract, 1929.
Alvarez, W. C.: Nervous Indigestion, 1930.
Carlson, A. J.: Ill. Med. Jour., 55:429, 1929.
Carlson, A. J.: Jour. Am. Med. Assn., 94:78, 1930.
Friedenwald, Julius; Feldman, Maurice; and Rosenthal, Louis J.: Trans. Assn. Amer. Phys., 44:324, 1929.
Gardner, E. L.: Minn. Med., Dec., 1926.
Gardner, E. L.: Personal communications.
Hurst, A. F.: Essays and Addresses on Digestive and Nervous Diseases, 1924.
Keith, Arthur: Brit. Jour. Surg., 2:576, 1915.
Starling: Human Physiology, 1920.

BENIGN POLYPS OF THE COLON AND THEIR RELATION TO CANCER*

Harold E. Hullsiek, M.D., F.A.C.S.
Saint Paul

CANCER claims one out of twelve in the human race. One out of every thirty lethal cancers occurs in the rectum. Carcinoma of the intestinal tract comprises 12 per cent of all cancers of the body, and of these, 65 per cent are in the rectum. Lockhart-Mummery, after a study of two hundred cases of carcinoma of the rectum, believes that the most important predisposing cause, apart from age, is the presence of benign adenomata. In a large majority of his cases in which a segment of bowel had been resected for carcinoma, associated adenomata were present. Verse asserts that most gastro-intestinal cancers arise from simple adenomata, themselves the result of inflammatory hyperplasia.

In a series of one hundred and twenty-seven cases of multiple polyposis collected from the literature by the author in 1928, the known malignancy incidence was 34.6 per cent. An additional thirty-one of these patients died after having suffered symptoms which were very suggestive of malignancy, so that it is reasonable to suppose that the index is considerably higher than the figures show. Jones says, in speaking of polyps, that they are, ". . . a condition we have come more and more to believe of great importance, of even greater importance than carcinoma itself, for polyps frequently become carcinoma, and proper treatment before they become malignant means permanent cure." Yeoman says, in speaking of single, benign polyps, "Unless thoroughly removed at the base they are likely to recur and are prone to malignant degeneration." Nowhere, according to Ewing, can more clearly be demonstrated the logical transition from simple inflammatory hyperplasia to tumors which are morphologically, pathologically, and clinically adenomata and carcinomata. The foregoing remarks and quotations should be sufficient to emphasize the necessity for a keen appreciation of the potential dangers of benign tumors of the bowel.

A tumor, Ewing says, is an autonomous new-growth of tissue, and may be classified according to one of three plans, regional, etiological, and histological. The tumors under consideration are obviously best discussed from the histological standpoint, yet at times they must also be considered as to their morphological features.

In a collection of 46,379 cases of rectal disease of all types, benign tumors were found in 554 instances. Dewis collected in 1904 reports of 219 cases of benign tumors of the intestinal tract, on each of which a microscopic diagnosis was available. Leichenstern collected from the literature 128 intestinal polypi. Of the total 247 cases in the two series, 243 tumors were in the rectum and colon, and 202 were adenomata. We are able to state with a reasonable degree of assurance that approximately 50 per cent of all the benign growths of the intestinal tract are in the rectum, hence well within reach of the examining finger. The moral is obvious.

We find in the colon angiomata, fibromata, myomata, lipomata, adenomata, and papillomata or villous tumors, the latter being extremely rare. The distribution of the various types is shown in the accompanying table of Dewis' and Leichenstern's 347 cases. An inspection of this table shows a preponderance of adenomata in almost all parts of the intestinal tract, there being a total of 255 adenomata in 347 cases.

TABLE I

	Angioma and Papilloma	Fibroma	Myoma	Lipoma	Adenoma	Total
Duodenum	0	0	3	6	6	15
Jejunum	0	0	2	4	8	14
Ileum	0	2	11	7	37	57
Appendix	0	0	1	0	2	3
Cecum	0	0	3	2	6	11
Colon	0	1	5	10	40	56
Rectum	2	2	10	6	156	176
Small bowel	1	0	1	2	0	4
Intestine (undefined)		0	4	7	0	11
Total	3	5	40	44	255	347

Analysis of Dewis' 219 cases from a slightly different angle shows similar results.

---

*From the Miller Clinic. Presented before the Northern Minnesota Medical Association, Moorhead, Minnesota, September 19, 1930.

Table ii

	Total No.	Per cent	Rectum	Per cent
Angioma	3	1.3	2	66
Fibroma	5	2.2	2	40
Myoma	40	18.2	10	25
Lipoma	44	20.0	6	14
Adenoma	127	57.9	81	64

Here we find that 57.9 per cent of the 219 tumors reported by Dewis were adenomata, and 64 per cent of these were situated in the rectum. The distribution of adenomata in comparison with all other forms explains the interest surrounding them in a consideration of benign tumors of the colon.

Table iii

	Small gut Per cent	Large gut Per cent	Rectum Per cent
Adenoma	11	25.2	63.8
All other forms	48	27.1	24.8

The adenomata will be seen to increase in frequency in direct proportion as we proceed distally through the gastro-intestinal tract. In the small bowel other tumors are four times as common; in the large gut they occur with the same frequency as all other forms combined.

Adenomatous polyps are important not only because of their frequent occurrence, but are of primary interest for the same reason that any benign tumor attracts more than passing attention—its potentiality of becoming malignant. In the author's collected series of multiple adenomata there was a known malignancy of 34 per cent while in Soper's series the figure was 43 per cent. In the author's series of personal cases of single polyps, there were, in twenty-five cases, six that were cancerous.

New-growths in the colon may or may not be polypoid in shape. The word polyp has a purely morphological application and bears no relation to histological character. A polyp is merely a new-growth with a pedicle and may be an adenoma, fibroma, or a lipoma, and may be benign or malignant. The numerous attempts at a classification of polyps, either clinical or pathological, have been unsatisfactory. Mummery groups the adenomatous polyps of the colon as follows:

1. True multiple adenomata.
2. Multiple polyps associated with hyperplastic tuberculosis.
3. Polyps accompanying old strictures of the rectum.
4. Polypoid conditions resulting from ulcerative colitis.

It will be seen that the latter three groups in the above classification have definite associated irritative lesions. The relation of polyps to mucous membrane irritation is well known.

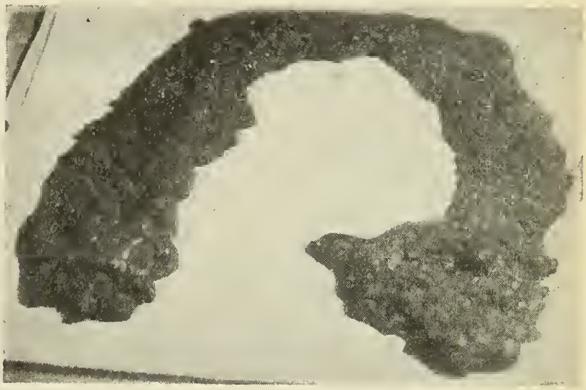


Fig. 1. Fresh specimen of colon showing multiple polyposis, removed from father.

In discussing adenomata it should be recalled that there are two apparently distinct types which, although histologically similar, are different in distribution, in the production of symptoms, in prognosis, and many other ways.

Erdmann and Morris in 1925 suggested a clinical instead of a pathological grouping, which seems very adequate. Single or scattered polyps, sometimes the obvious result of irritation, again with no discoverable associated etiologic lesion, sometimes quiescent and discovered incidentally, at other times producing violent symptoms necessitating immediate intervention, constitute the class now known as the acquired type. Clinically this type of adenoma occurs most frequently in children, but is also often seen in adults. In my own series the ages ran from three to seventy-one years.

As has been said, 63 per cent of the adenomata of the intestinal tract are located in the rectum. The single polypoid adenoma may be found immediately inside the anal canal, in the ampulla of the rectum, at the recto-sigmoid, or in the sigmoid itself. Palpable pedunculated tumors in the anal canal are more likely to prove to be hemorrhoids which have undergone inflammatory change. If situated low down the tumor sooner or later develops a sufficiently long pedicle that permits it to protrude during defecation. A frequent site for single polyps is the anterior wall of the rectum at the sharp fold marking the recto-sigmoid.

The adenomatous polyp is in some cases not a true adenoma but merely a polyp covered with more or less normal mucosa. Macroscopically it is bright red, glistening, mulberry-like, and varies in size from 2 to 3 centimeters in diameter to that of a walnut. Tumors the size of an orange have been reported. These tumors bleed easily and thus exhibit as one of their early symptoms a streaking of blood in the stool. The pedicle may be short and thick, or slender and several inches in length. Microscopically they are seen to spring from the mucosa of the intestine and have a connective tissue stalk covered with glandular epithelium showing a hyperplasia. Ewing calls the development of adenomatous polyps "inflammatory adenoid hyperplasia."

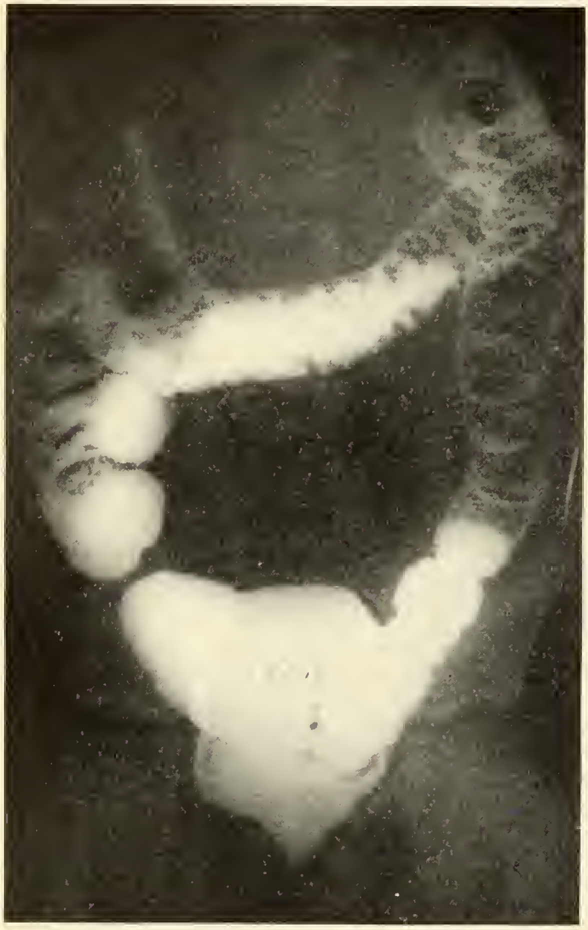


Fig. 2. Roentgenogram of ten-year-old son, showing multiple polyposis.

In considering the question of malignancy in single polyps we must remember that these tumors are usually promptly removed as soon as they are discovered, thus ending once and for all any chance of their becoming malignant. In my series of single polyps there was a malignant degeneration in 24 per cent. From the fact that benign, solitary adenomata are frequently seen in children, one would feel that the incidence of carcinoma of the rectum in childhood should be higher than is actually the case, if these tumors have such a high malignancy index. Unfortunately we have no information as to the length of time these tumors may be present before cancerous change occurs, but apparently it may be years.

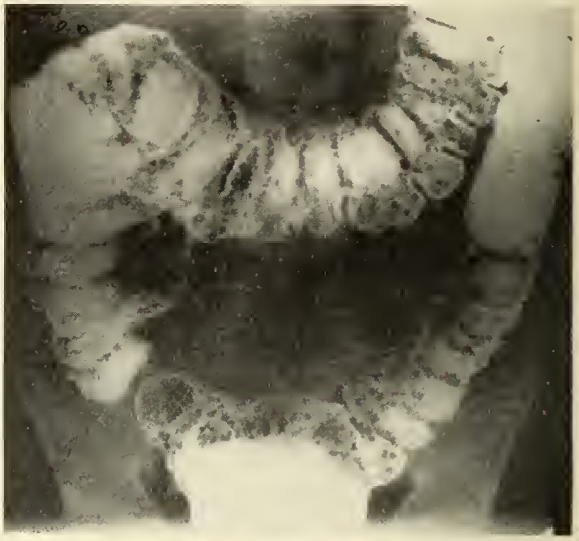


Fig. 3. Same as Figure 2.

The symptoms vary from none at all to slight signs in the case of small tumors, to occasional bleeding, and, depending on the size and location, tenesmus, and a sense of incomplete defacation, to obstruction or intussusception in the case of large ones. The following table shows the symptoms in the author's series.

TABLE IV

No symptoms	5
Bleeding only	7
Bleeding and irritation	1
Bleeding and discharge	2
Bleeding and prolapse	4
Prolapse only	1
Bloody diarrhea	2
Sense of incomplete evacuation	1
Pain referred to bladder	1
Obstruction	1

Bleeding is one of the earliest symptoms of carcinoma of the rectum. Buie says, "Bleeding is the most constant sign of malignant disease of the lower colon. Bleeding is probably one of its earlier manifestations." It will be seen from the above table that bleeding occurred as one of the symptoms in sixteen out of twenty-five patients. Jones says, regarding polyps: "Blood is also present with polyps of the colon or rectum, a condition which we have come more and more to believe to be of great importance, of greater importance than carcinoma itself, for polyps frequently become carcinoma, and proper treatment before they become malignant means permanent cure."

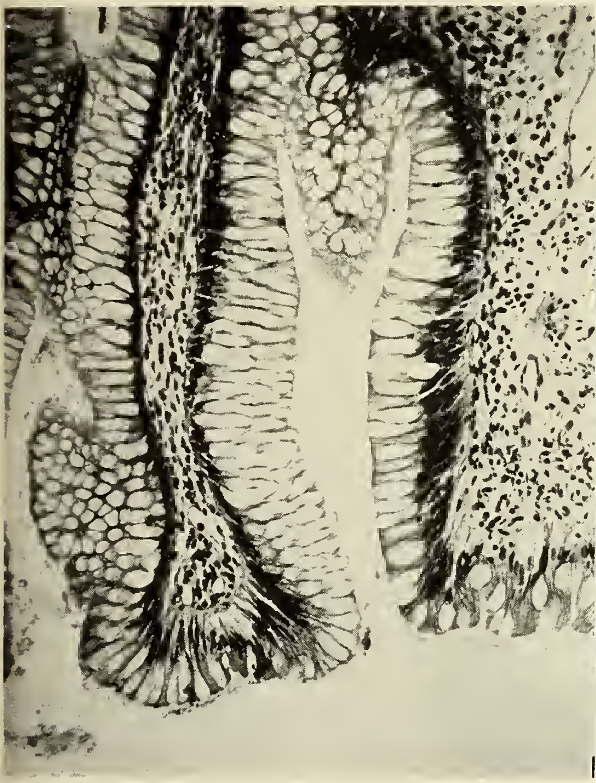


Fig. 4. Benign polyp, high power, from father.

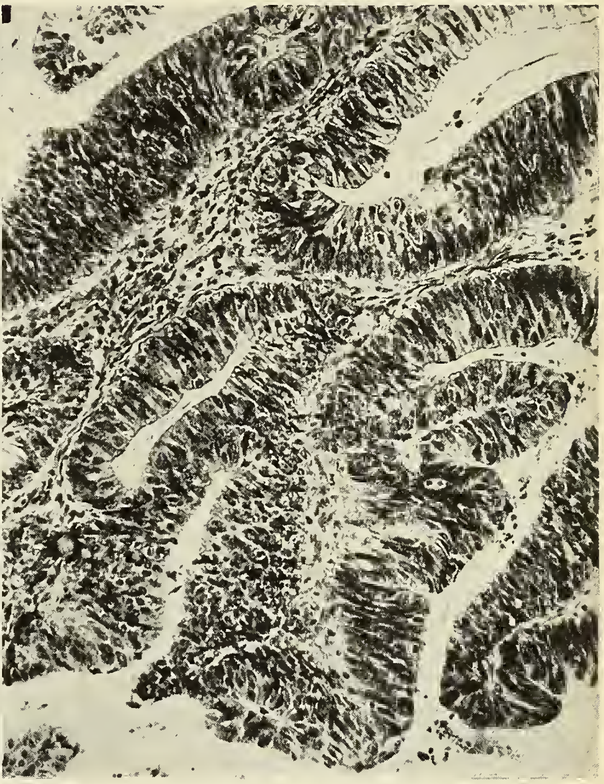


Fig. 5. Malignant polyp, high power, from father.

Single adenomatous polyps should be considered as pre-malignant growths and as such should be promptly and completely removed when found. If the growth is low in the anal canal or rectum the sphincter may be relaxed with novocaine, after which the polyp may be prolapsed and the pedicle ligated. If high in the rectum or in the sigmoid they may be removed through the proctoscope by means of a snare. Certain precautions should be used in snaring tumors which are situated above the lowest valve of Houston, since at this level the peritoneal reflection occurs and too full a bite may result in an opening into the peritoneal cavity. Ordinarily, even with a cold snare, the bleeding is only slight but may occasionally be troublesome. One of my cases bled sufficiently to fill the rectum with clots several times and ceased only when the stump of the pedicle was fulgurated. No difficulty of this sort has occurred since using the diathermy snare.

In the case of congenital, multiple polyposis we have an entirely different picture from that of a single polyp. In this type we find the mucosa of the bowel replaced by hundreds of small polypoid adenomata. Luschka estimated the number in his case at 10,000. This form usually makes itself evident in childhood or early youth and rarely has a discoverable associated etiologic lesion. This disease has a distinct familial tendency and a malignancy index of from 40 to 50 per cent. This is the true multiple, adolescent, congenital polyposis, and to this type only should the term multiple polyposis be applied. Scattered single polypi do not necessarily indicate a multiple polyposis.

The average age in 127 cases of multiple polyposis was 30.9 years, with an average duration of symptoms of over 10 years. As to familial tendencies we may again quote Lockhart-Mummery. He says: "It appears to be a hereditary condition, as it can be traced through several generations, and the curious thing is that in such families a large proportion of individuals die at a comparatively early age from cancer of the bowel." Dukes reports one family in which his patient had multiple polyposis, while his mother, six uncles and aunts, and a grandfather died of cancer of the bowel. I have a patient at present under my care with this condition, a boy ten years of age (Figs. 1-5). His father and uncle died of multiple polyposis, verified at autopsy, while the grandfather died of cancer of the rectum.

In a consideration of any surgical procedure in cases of multiple polyposis it immediately becomes evident that the type of operation selected is governed by certain features of each individual case. We must consider the question of malignancy, which is often present already when the case is first seen, extent of involvement, general condition of the patient, and the technical ability and surgical experience of the operator. The treatment is by no means standardized, and is in general very unsatisfactory. Ileosigmoidostomy followed by colectomy has been successfully done three or four times for the relief of this condition. Coffey successfully performed a total colectomy on a woman with the disease. Appendicostomy has failed entirely in some cases, while in others it apparently afforded relief while the opening persisted, only to have the tumors spring forth with renewed vigor when the appendicostomy was closed. Radium and X-ray therapy have been employed, but with disappointing results. Ileostomy or cecostomy with irrigations has resulted in at least a temporary disappearance of the tumors. Erdman says: "One may sum up the present status of treatment of this condition by saying that the only method which holds out any hope for cure in the disseminated variety is one imposing upon the operator great technical difficulties, upon the patient great danger, and upon both the possibility that a successful operation may prove fruitless because the operator has been unable to determine accurately the extent of the process, and has, therefore, left behind areas capable of transmitting all the original potentialities of the disease."

The cause of death in multiple polyposis is in 50 per cent of the cases due to carcinoma. The remainder die from anemia, sepsis, exhaustion, and starvation. Fortunately it is a comparatively uncommon condition.

Little has been said in this paper concerning the other benign tumors of the colon because of their comparative infrequency of occurrence as well as proneness to remain benign. The adenomata represent a problem which we must face as one of the things to be recognized in our struggle with cancer. Early recognition and early operation are of paramount importance in the treatment of this dread disease, and an appreciation of the menace of the commoner benign polyps of the colon will lead to earlier diagnosis of cancer, a larger number of operable cases, and a consequent lowering of mortality.

Hamm Bldg.

DIAGNOSIS AND TREATMENT OF PILONIDAL SINUS*

James Kerr Anderson, A.B., M.D.
Assistant in Surgery, University of Minnesota
Minneapolis

THE finding of a pilonidal sinus in a surgical practice is a fairly common occurrence, more so in fact than is generally thought. The fact that this anomaly is listed under many different names is confusing. In reviewing most of the available literature on the subject, the following names have been attached to it: coccygeal, sacrococcygeal or sacral fistula, sinus or dimple; post-anal dimple, fistula or fissure; posterior umbilicus; post-sacral or sequestration dermoid; pilonidal sinus or cyst.

The comparative infrequency of this type of sinus as compared with other types about the anal region and the essential treatment of them, particularly when they become infected, warrants a review of the subject. The condition was first described in 1867 by J. M. Warren in Surgical Observations, published in Boston. The name pilonidal sinus literally means a nest of hair and this often properly describes the condition, although in many cases no hair is found. Just how this sinus in the posterior median line is formed is a matter of some controversy and many theories and anatomical explanations are forthcoming. The majority do feel that the condition is congenital and the result of a faulty coalescence of the cutaneous covering of the back during early embryonic life or, stated differently, an imperfect approximation of the lateral halves of the fetus involving only the integument. Mummery states that the sinus is only an exaggeration of the post-anal dimple and that they are really sequestration dermoids due to the skin being shut off from the external surface. Drueck believes that the sinus does not connect with the other structures but is a subcutaneous tract lined by epithelium and ending blindly. Bookman, using the name sacro-coccygeal sinus, says that it is the result of the breaking down of a sacro-coccygeal cyst. Bevan reports forty cases and states that it is congenital and consists of a bud of epithelium turned under the external integument. Warren in the original article advances the theory that the cause of the trouble is a reversed hair follicle and that the turned in hair as it continues to grow pulls its hole in after it. Wendelstadt, quoted by Morter, advances the following theory: "The inferior end of the spinal cord is the last portion of the cord to lose its connection with the skin; as the sacrum fuses it pinches off this connection and the skin becomes attached by fibrous tissue at this point to the posterior surface of the sacrum. As adult life approaches, fat and soft parts grow and lift the skin further away from the bone. The attached part is thus drawn into a dimple or sinus." Streeter, of the Carnegie Institute, examined histologically a specimen removed by Dr. Stone and feels that it is special downgrowth of epithelium, originating from the true skin and not the medullary groove, none of the elements of the true skin being fully developed, the hair being thin and fine and the pigment scanty like lanugo. Herman and Toureux, also quoted by Morter, showed that after separation of the spinal cord from the superficial tissues a process of epithelial tubules persist for a time at the site of the previous connection of the neural axis with the skin, forming a vestigial remnant which normally disappears. When atrophy fails to take place a pilonidal sinus may develop. If included ectoderm is completely surrounded it is called a cyst; if partially so a sinus or fossa.

These sinuses are congenital and are the result of an infolding of the epithelium. Whether this is an active downgrowth or at a certain point the epithelium remains fixed to the underlying tissues and subsequent growth of the intervening tissues deepens the dimple we cannot say. We do not feel that it has any connection with the neural canal. These sinus cases, however, rarely come to the physician unless they become infected, which results in all the symptoms of an acute inflammatory process over the sacrum. Sweat, hair, debris plus trauma, lead to inflammation which terminates in abscess, fistula or the formation of a true cyst. The location renders them susceptible to trauma and it is difficult to keep them scrupulously clean. Proximity to the rectum also may be a factor in infection.

---

*Read before the Northern Minnesota Medical Association, Moorhead, Minn., September 19, 1930.

As to the diagnosis the location over the sacrococcygeal region, superficial to the sacrum, and the characteristic appearance of the "stitch hole" opening, usually single and several inches above the anus should make one suspicious. In case hair is protruding from the opening, the diagnosis is certain; but this is not always present. Upon closer examination the sinus tract will be found in a large majority of cases to extend upward rather than toward the anus, parallel to the long axis of the body and no connection will be found with the anus or rectum, variation in depth and diameter being marked. One author states that the sinus may surround the rectum but never enters it, seldom however deviating from the midline. It may break into the rectum following inflammation and plugging of the tract. There may be several external openings but usually one will be found to be lined with skin and the others with granulation tissue and have ragged ulcerated orifices, these acting as channels for drainage when the original tract becomes obstructed. Multiple openings all connect with the original sinus. The great majority of these cases are reported to have been found in those with excessive pilous growth and the large percentage in males. Stone reports sixty-one cases, 84 per cent occurring in males and all white, in spite of the large colored population in Baltimore. Gant reports a series of eighty cases with 80 per cent males. Another author reports a series of eighty-one with 66 per cent males. In twenty-nine of these eighty-one, hair was found in the sinus or protruding from it. The sinus may remain undetected for some time or until injury or infection occurs and draws attention to that part and indicates surgical interference. Many cases give the history of having been operated upon several times with a later recurrence. This is due to the fact that all the lining of the sinus tract was not removed. Ninety-five per cent of the cases are infected when first seen and this alone usually brings them to the physician. The sinus is rarely found in children as it is not looked for and infection has not yet taken place. It may be found with a spina bifida and Moise reports a pilonidal sinus which connected with the spinal cord through a spina bifida occulta and resulted in a staphylococcic meningitis. Ripley and Thompson also report a case in a child extending to and communicating with the arachnoid space which also resulted in a staphylococcic meningitis and death. These two cases would suggest a medullary origin of these sinuses. Connection with the canal, however, is rare. Brams suggests that all cases should have a lipiodol injection to determine the extent, location and possible connection with the canal. Some patients give a familial history of these sinuses.

Infected pilonidal sinus should be differentiated from osteomyelitis, tuberculosis or lues of the coccyx or sacrum by X-ray examination and the fact that there is no bone felt with the probe; from anal or rectal fistulæ by the type of opening, direction and lining of the tract and character of the discharge, whether fecal or not; from ordinary pyogenic processes by the presence of epithelial lining in the abscess cavity and the tract, and the lack of proper healing. If there is a tuft of hair extending out of the opening the diagnosis is certain. Plugged sebaceous follicles may simulate the condition, but these are very shallow. Teratoma, fetal implantations, traumatic dermoids, implanatation cysts, have to be differentiated by gross and microscopic examination.

Treatment.—The recognition of this condition and its pathology is most important in order that the proper type of treatment may be applied and a permanent cure effected. Radical excision of the whole infected area when not too large is the surest method. In cases with large abscess formation, drainage, followed, when inflammation has subsided, by complete excision of all the sinus tracts and their lining as well as all cyst tissue, has in our hands been successful. Various other methods have been employed and cures reported in a few cases. Unless the surgical pathology is recognized, embarrassment may result. The tracts and epithelial lining must be removed completely or the wound will not heal. We have found it best to let the wound granulate in, the only objection to this being the time required. Lahey of Boston moves over a flap of skin and fat and so allows granulation to take place in tissue that is known to be healthy. The excised wound may be sewed up tightly but in our cases this proved satisfactory in only two cases.

In case the sinus opens into the rectum it is necessary, as in the treatment of other types of fistulæ, to divide the sphincter, as well as to remove the sinus lining. Maillard reports one case treated successfully by the galvanic current without pain or incapacitating the patient. If the case is seen before infection has taken place various destructive agents may be tried, as nitric acid, silver nitrate, carbolic acid, actual cautery, etc. Tuttle in his textbook states that occasionally pulling out the hairs and cauterizing the tract with silver nitrate will result in obliteration. Crookall reports a method of treatment in which he scalps the skin over the diseased area, cleans out the tract and packs with pure powdered silver nitrate and leaves this several days, when the entire lining membrane comes away and the wound begins to granulate; this method to be used when the accepted surgical treatment cannot be carried out. When severe infection or abscess is present, incision is indicated, to be followed when the acute stage has subsided by radical treatment as mentioned. Indication that all cyst or sinus wall has not been removed will be given by continued drainage and lack of healing in certain parts of the base or sides of the wound or by the finding of small openings in the base or sides which will admit a probe. At the time of operation one may be certain that all the cyst tissue has been removed but several days later a small grayish area may be seen in one or more spots which indicates incomplete removal and requires further excision to insure healing. Morter reports thirteen cases of infected sinus in which, following radical excision and partial primary closure followed with Dakin's solution, 85 per cent of the wounds healed without becoming infected. Morter also states that failure in treating these cases is due to too early operation following incision and drainage for the acute stage, accidental opening of the tract during operation causing contamination. Simply cleaning out the tract when uninfected may be sufficient, but after infection palliative methods are useless.

Anesthetic.—Gas, oxygen, local block or spinal anesthesia are usually used, much depending on the choice of the patient. Epidural anesthesia may be used, but owing to the fact that there is infected tissue in the region which may be penetrated it is not wise. The possibility of deformity of the bony structures also contradicts it.

Dr. W. A. Fansler and myself have operated upon twenty cases of infected pilonidal sinus, using radical excision or removal of the tract and cyst tissue. Eighteen healed by granulation in an average of nine and a half weeks; two by first intention, following closure of the wound. Seventy-five per cent of the patients were males. Fifty per cent gave a history of having been previously operated upon. The sinus ran upward from the external opening in all but four cases: two ran to the left and two to the right. Trauma directed the attention to the sinus or caused some change in it in two cases. Single "stitch hole" openings were the rule, multiple ones being found in six and in these cases the secondary openings were not typical and represented avenues for drainage. Nearly all sinuses opened into large abscess cavities. None was encountered opening into the rectum and it was necessary to remove the coccyx in only one instance.

SUMMARY

1. The location of abscess, swelling or soreness over the sacro-coccygeal region should always arouse suspicion of the presence of a pilonidal sinus.
2. Cases are rarely seen except when infected.
3. The exact etiology of pilonidal sinus has not been determined but we feel that it is an embryonic defect involving only the epithelial covering.
4. Hair was found in the sinuses or protruding from them in a few instances in our series but 50 per cent had been previously operated upon.
5. X-ray of the region should be carried out and the injection of an opaque medium is recommended.
6. Radical excision of the entire area if possible or of the cyst lining after drainage is the treatment of choice.
7. Primary suture is occasionally successful.

TYPICAL CASE REPORTS

W. S. O., a male, aged 31, has had for the past four or five years an abscess over the sacrum which would either rupture or require incision. This has healed and then broken open five or six times, the last time two months ago, since when it has continued to drain.

Examination showed a large inflammatory area over the sacrum with a stitch hole epithelial lined opening over the coccygeal junction which is partially occluded owing to the swelling. A probe could be introduced for two inches upward over the sacrum. At operation the inflammatory mass was excised in toto, the wound healing by granulation in six weeks. When examined the sinus was found to divide into two lateral ones, each lined with a greyish membrane which also lined the abscess cavity. Gas-ether anesthesia was used.

R. N., a male, aged 35, had had a soreness and swelling above the rectum which had been incised and has been draining off and on for about one year.

Examination shows three stitch hole openings in the posterior mid-line one to two inches above the anus. There is quite an area of swelling and redness about one and one-half inches in diameter and there is a purulent discharge from the uppermost opening. A probe introduced into this opening comes out the lower ones.

At operation the entire mass was excised in toto under spinal anesthesia. Long hairs were found in the cyst sac. Healing occurred by granulation in six weeks.

E. S., a female, aged 20, a very hairy type, about one year ago noted swelling and some tenderness over the sacrum. This was thought to be a boil and a poultice was used, which caused the swelling to break. Following this it apparently healed, but about one week before coming to us she again noted swelling and soreness which this time evacuated itself and has continued to drain blood-stained pus copiously. Her physician thinking that she had some bone disease referred her to an orthopedist, who recognized the condition and she was referred to us. Examination revealed two small openings over the sacro-coccygeal articulation, both discharging pus. The upper opening was surrounded by excessive granulation tissue. A probe was introduced into the sinus tract upward for about 10 cm. and an area of induration the size of one's hand was present over the sacrum. X-ray revealed no bone disease. Radical operation was performed and the entire mass excised. The wound healed by granulation.

F. G., a female, aged 23, had had a pilonidal sinus for five years, which occasionally would swell and discharge pus, had been operated upon three times for radical cure, but had failed to completely heal.

Examination showed an inflammatory area over the sacrum with several small openings which admitted a probe in all directions.

At operation the entire area was excised. Practically all of the cyst tissue was found in the wound. Healing occurred by granulation in three months. Spinal anesthesia was used.

BIBLIOGRAPHY

1. Bevan, A. D.: Pilonidal cyst. Am. Jour. Surg., 6:554 (April), 1929.
2. Bookman, M. R.: Treatment of sacro-coccygeal sinus (pilonidal sinus). New York State J. Med., 24:204 (Feb.), 1924.
3. Brams, J.: Injection of pilonidal sinus with lipiodol. Radiology, 8:248, 1927.
4. Crookall, A.: Preliminary report of the treatment of pilonidal sinus with silver nitrate. Tr. Am. Proctol. Soc., 28:32, 1928.
5. Drueck, C. J.: Fistula of the Anus and Rectum, p. 272, F. A. Davis Co., 1927.
6. Dulligan, P. J.: Pilonidal cyst. Am. Jour. Surg., 6:554 (April), 1929.
7. Gant, S. G.: Diseases of the Rectum, Anus and Colon, 1:178, W. B. Saunders Co., 1923.
8. Graham, W. D.: Pilonidal sinus. Jour. Am. Med. Assn., 88:151 (June 12), 1897.
9. Hodges, R. B.: Pilonidal sinus. Boston Med. and Surg. Jour., 103:485 (Nov.), 1880.
10. Kelsey, C. B.: Diseases of the Rectum and Anus, p. 153, Wm. Wood and Co., 1882.
11. Lahey, F. H.: An operation for pilonidal sinus. Surg., Gyn. and Obst., 48:109 (Jan.), 1929.
12. Lynch, J. M.: Diseases of the Rectum and Colon, p. 478, Lea and Febiger, 1914.
13. Maillard, E. R.: Nonsurgical treatment of pilonidal cyst. Jour. Am. Med. Assn., 93:1383 (Nov. 2), 1929.
14. Martin, C. F.: Pilonidal sinus. Tr. Am. Proctol. Soc., 25:21, 1925.
15. Masson, J. C.: Sacro-coccygeal sinuses and cysts. Surg. Clin. Nor. Am., 5:737 (June), 1925.
16. Moise, T. S.: Staphylococcus meningitis secondary to congenital sacral sinus. Surg., Gyn. and Obst., 42:394, 1926.
17. Morter, C. W.: Excision of pilonidal sinus with partial primary closure. Tr. Am. Proctol. Soc., 29:13, 1929.
18. Mummery, P. L.: Diseases of the Rectum and Colon, p. 655, Wm. Wood and Co., 1923.
19. Pennington, J. R.: Diseases of the Anus, Rectum and Pelvic Colon, p. 580, P. Blakiston Son and Co., 1923.
20. Ripley, W., and Thompson, D. C.: Pilonidal sinus as a route of infection in a case of staphylococcus meningitis. Am. Jour. Dis. Child., 36:785 (Oct.), 1928.
21. Stone, H. B.: Pilonidal sinus, coccygeal fistula. Ann. Surg., 79:410 (March), 1924.
22. Straus, W. A.: Pilonidal sinus. U. S. Naval Med. Bull., 23:376 (Nov.), 1925.
23. Tuttle, J. P.: Diseases of the Anus, Rectum and Colon, p. 752, D. Appelton Co., 1902.
24. Warren, J. M.: Surgical Observations. Boston, p. 192, 1867.

DETECTION AND TREATMENT OF RESPIRATORY INFECTIONS AMONG UNIVERSITY STUDENTS

E. Hanson, M.D., and J. Arthur Myers, M.D.
Minneapolis

SINCE 1920 special interest and attention have been devoted to the prevention and treatment of all types of respiratory infections among the students of the University of Minnesota. A paper was published in this journal in April, 1925, reporting the first four years of the work done in the chest clinic of the Students' Health Service. At that time 803 students had reported for special chest examinations.

From September, 1924, to September, 1928, the second four year period of the chest clinic's existence, 747 students reported for examination. The registration of students entering the University is not considered complete until each student has undergone a physical examination. All students who present unusual chest findings at this time are referred to the chest clinic for special study. Students enrolled in the university who present themselves for treatment of colds and other upper respiratory infections whose conditions seem to have become at all chronic are encouraged to report for special chest examinations. In a lesser number of instances students who are aware of the danger to themselves of massive exposure to respiratory infections report for examination at regular intervals. This is especially true of student nurses and medical students whose work presents the added hazard of more frequent exposure to tuberculosis. The one great object of the chest clinic is the early detection of any chest condition which may become chronic. And to this end the coöperation of every other department of the Student Health Service and usually of the patient concerned has been freely given.

When a student applies for examination, a history is taken with special reference to exposure to tuberculosis, previous respiratory disturbances, onset of the present trouble, etc.

In Table 1 we have tabulated the diseases from which the 747 students had, according to their statements, previously suffered.

From this table it will be observed that influenza, pneumonia, "dry pleurisy" and bronchitis occurred most frequently. Of the 747 patients, thirty-seven gave a history of having had tuberculosis. Of this group only seven gave histories of a definite known exposure to this disease, while sixty-seven others had lived with members of their own families who had active tuberculosis, but had themselves never become ill from the disease.

Table 1

FREQUENCY OF RESPIRATORY DISEASES AS INDICATED BY PAST HISTORY

Influenza	399
Pneumonia	150
"Dry pleurisy" (Fibrinous)	151
"Wet pleurisy" (Effusion)	32
Bronchitis	202
Tuberculosis	37
Bronchial Asthma and Hay Fever	43
Empyema	14
Gassed	5
Bronchiectasis	1
Total Number of Students Examined	747

In the majority of cases, students present themselves with two or more definite symptoms of respiratory disease. Only those who had adopted for themselves the plan of periodic "check-ups" were at times symptom-free. Table 2 indicates the frequency with which each symtom or complaint occurred.

Table 2

FREQUENCY OF COMPLAINTS AS REPORTED BY STUDENTS

Cough	444
Expectoration	361
Chest pains	309
Loss of weight	181
General malaise	317
Shortness of breath	271
Night sweats	50
Fever	7
Hemoptysis	33
Bloody sputum (streaking)	40
Hoarseness	181
Fistula	9
Mastoid	1
Ear abscess	1
Cervical abscess	1
Total number of cases	747

On physical examination, the findings in the vast majority of cases were normal. This examination was limited to the cervical and thoracic regions, and the findings elicited by the methods of inspection, palpation, percussion and auscultation were as follows: axillary lymph node enlargements 51; retractions of chest wall 10; lagging of chest wall 8; impaired resonance 11; rigidity 4; impaired or abnormal voice conduction 28; breath sounds impaired 6; and râles 90.

With but few exceptions, stereoscopic X-ray films were made of the chest. They were always found of great help in diagnosis and aided materially in determining the extent of involvement, if any.

Tuberculin tests were applied routinely. The sputum was examined microscopically in all cases where any indication existed for so doing.

With the history, physical signs, symptoms and laboratory findings noted, the diagnoses made in these 747 cases are indicated in Table 3.

TABLE 3

CONDITIONS FOUND IN 747 STUDENTS GIVEN SPECIAL CHEST EXAMINATIONS

Negative	444
Diagnosis undetermined	35
Acute bronchitis	49
Chronic bronchitis	28
Acute upper respiratory infection	20
Pleurisy with effusion	6
Proved tuberculous pleurisy	3
Healed empyema	4
Chronic fibrous pleurisy	30
Pneumothorax—spontaneous	5
Bronchial asthma	10
Bronchiectasis	16
Tuberculous lesions demonstrated by X-ray	106
Cervical adenitis	3
Tuberculosis of bone (hip)	2
Unresolved pneumonia	2
Pneumonia	2

From this table it will be seen that in the great majority of cases, 444, negative diagnoses are made. These were students who came in with less aggravated symptoms or with only histories of massive exposure to tuberculosis. Their X-ray studies showed no pathology and result of laboratory work in general was not indicative of any active disease. These students were encouraged to continue their regular curricular activities. In many cases their fear of physical examinations was overcome and we believe that many of them will be convinced of the value of periodic examinations which should aid materially in detecting and checking the inroads of insidious chronic respiratory conditions.

Acute bronchitis was diagnosed in forty cases. Treatment here consisted of bed rest, hot applications, abundant fluids with a light easily digested diet; sedatives were administered whenever necessary for cough.

In 106 cases the X-ray studies showed the presence of tuberculosis. Of these, forty-one gave positive clinical evidences of the disease. In forty-five of the cases detected by X-ray films, the tuberculous lesions appeared to be well under control. Three cases were diagnosed as cervical adenitis, and tuberculosis followed pneumonia in four cases. There were also three students who came in with pleurisy with effusion, tuberculous in origin, and one case of sacro-iliac tuberculous disease. Of the pulmonary cases, thirty-five were diagnosed as clinical fibroid tuberculosis. The pulmonary lesions were bilateral in thirty cases and eleven showed cavity formation.

Of the forty-one cases of clinical tuberculosis, nine gave histories of massive exposure to the disease; that is, one or more deaths had occurred in the patient's own family, a sister, brother or parent having died or been under prolonged treatment of this condition. It is interesting to note that ninety other students who showed no clinical evidence of tuberculosis gave a history of similar massive exposure. Of the above forty-one cases, ten had been diagnosed as tuberculous at some previous examination.

In the clinical cases the symptoms present at the time of examination were as follows: persistent cough 39; expectoration 25; dull indefinite chest pains 25; general malaise 30; loss of weight (from 5 to 20 pounds) 21; dyspnea 20; afternoon temperature elevation 2; night sweats 6; blood streaked sputum 4; hemorrhage 7. Of the total number of cases (747), 4.4 per cent gave histories of frank hemorrhage as compared to 17 per cent in the cases (41) of clinical tuberculosis.

In all cases of active clinical tuberculosis students were advised to discontinue their activities and seek treatment at once.

A number of times during the last eight years students have reported for examinations who were found to have frank pulmonary tuberculosis which appeared to be of long standing. Cavities were present. Tubercle bacilli were abundant in the sputum; yet our examination was the first that had ever been made. Some of these students had reached the junior or senior years in the university. They had been mingling with other university students. They were unsuspected cases of tuberculosis. Yet they were perhaps more dangerous to their fellow students than the girls and boys who had previously known of their disease, and were employing the usual measures to protect others.

From such findings we are firmly convinced that dangers from tuberculosis will lurk among the students of the universities of this country just as long as we fail to make compulsory, careful examinations for tuberculosis of all entering students, and sufficiently frequent periodic examinations during their stay in the university.

The ordinary physical examination has never sufficed in the detection of tuberculosis. Before we knew how inadequate it is, perhaps we were justified in continuing its practice.

Observations of recent years have shown that there are two phases of an examination which must always be used if we are to detect the greatest possible number of cases of tuberculosis. These are the tuberculin test and the X-ray examination. The ideal procedure, therefore, would be to apply the intracutaneous test to every girl and boy entering a university. Nearly all who have ever been infected with tubercle bacilli will react positively to this test. Those who react positively should have X-ray film examinations. It is true that a simple fluoroscopic examination will detect those lesions of a more massive nature, but many of the minimal lesions will remain undiagnosed unless X-ray films are made.

A considerable number of entering freshmen will react negatively to the tuberculin test, but during their university months and years they may be exposed to tuberculosis. Therefore, at least every year—and better every six months—these negative reactors should be retested with tuberculin. All who become positive reactors should have X-ray films made of their chests. If disease is detected, whatever treatment is indicated should be administered. If disease is not detected, they should be placed on the list for frequent periodic examinations.

Tuberculin testing is a very inexpensive procedure. Fluoroscopic examinations do not cost much. X-ray films are relatively expensive, but inasmuch as a single film of the chest gives one such valuable information, it should never be omitted. In many universities at the present time it is a physical impossibility to make films of all positive tuberculin reactors. The funds are not available. In such institutions it may be possible to appropriate enough money to make films of all the students in one school. The best coöperation is usually secured from the students of the medical school, the school of nursing or the school of dentistry. As time passes and the procedure becomes more popular, and funds more readily available for this purpose, the entire university can be included in the program. Such a procedure may be likened to the application of a fine tooth comb to the student body in an attempt to comb out as many as possible of the cases of tuberculosis. Those found to have this disease will be rendered a great service—one which far more than justifies the expense. But perhaps greater than this, the entire student body will have been rendered a service and given an opportunity to live and work in a university environment free from the dangers of exposure to tuberculosis.

ORGANIZED CARE OF PATIENTS WITH ACUTE RHEUMATIC ENDOCARDITIS*

M. J. SHAPIRO, M.D.
Minneapolis

EACH year on re-opening the Minneapolis School Heart Clinic we are invariably met with a group of children who have just recovered from an attack of rheumatic fever and who have been referred to the clinic for proper disposition. This is a most serious situation and I feel the sense of responsibility as the problem is placed directly on me for disposal. Now, what are the possible methods of handling these children, methods which are at hand at the present time?

1. They can be sent home to be kept in bed until we are sure that all signs of activity are gone.
2. We can have their tonsils removed.
3. We can send them to Dowling School, where they will get the same treatment that the orthopedic cripples are receiving. This school was built originally to provide treatment for orthopedic cripples alone. About five years ago I obtained consent from the Board of Education to send a number of cardiac children to Dowling and I have had the opportunity of following them since. The children are conveyed to and from school in buses; all exercises are strictly supervised. Each child has a nap in school, he is served a hot meal at noon and is given sunlight treatment, either natural or artificial.
4. We can send them back to their regular schools, thereby evading the problem entirely.

In order to give you some idea of the situation as it presents itself I have gone over our records for this year at the Lymanhurst Heart Clinic. Amongst the sixty children examined since the beginning of the present school term, seventeen had their first attack of rheumatic fever some time in 1930, seven of them having been ill during April, 1930. Ten of the seventeen were found to have not only clinical evidence of cardiac involvement but cardiac enlargement on X-ray examination. The remaining seven were found negative to both clinical and X-ray examination and were diagnosed as potential heart disease. I might say here that a systolic murmur at the apex in a rheumatic child is not considered due to mitral disease unless the X-ray shows enlargement of the heart. It is most interesting to note that nine of these seventeen children had had their tonsils removed before this first attack of rheumatic fever, three still had their tonsils, and five had had their tonsils removed since the attack of the disease.

As I have said, I have had the opportunity of studying a group of children of this type at Dowling School during the past five years. I have been very much impressed with the fact that these children continue to show signs of rheumatic activity for months and years after the acute infection has subsided. Most of them continue to run a more or less constant low grade fever up to 100 F.; they are troubled with frequent attacks of pain in one or more joints; they complain of muscular pain; tachycardia is often present, even with an almost normal temperature; they are often pale and their weight fluctuates from time to time. While these signs of activity are going on it has been my rather disheartening experience to note constant and progressive changes in the heart. I have observed a number of children who have entered Dowling School when they showed merely evidence of a simple mitral regurgitation and as time went on I could hear first the development of the characteristic diastolic murmur of mitral stenosis and months later a suggestion of a diastolic whiff along the left border of the sternum which invariably after a period of time finally developed into a definite diastolic murmur of aortic regurgitation. Later still one could hear the systolic murmur of aortic stenosis appearing over the aortic area and still later the peripheral signs of aortic regurgitation. I have also had the unpleasant experience of watching five of this group develop subacute bacterial endocarditis while they were attending school. I have been able to predict in many instances, from the signs of rheumatic acitivity, which children would eventually show signs of increasing crippling of the heart.

---

*From the Department of Medicine, University of Minnesota, Minneapolis, and Lymanhurst School Heart Clinic. Read before the Central Interurban Clinical Club, December 6, 1930.

Confronted with such a situation it is apparent that it is impractical to attempt to send these children to their homes to be kept in bed. Anyone who has had any experience with this problem knows that most of these children come from the poorest homes. Then again they do not feel nor do they look sick. It is impossible to keep them in bed all alone for long periods of time. They become morbid and restless and this sort of reaction defeats the purpose of keeping them in bed. Then, too, they are prevented from attending school during this period and it is well understood that these children need education more than any other group, as it will be necessary for them to use their heads rather than their muscles as they grow older. Sending them home for bed rest is, then, not feasible; they might better go back to school and continue to develop the almost inevitable valvular heart disease.

How about taking out their tonsils with the hope of protecting them from repeated attacks and especially to protect their hearts? I believe it has now been conclusively proven that tonsillectomy does not protect the heart in rheumatic fever and in most instances does not protect against subsequent attacks. As I have shown from the short résumé of these seventeen new cases, nine of these children had had their tonsils removed, some of them four to five years previously, and still they developed rheumatic fever. In Kaiser's recent article in which he reported a study on some 2,000 children, he showed that children who had had their tonsils removed ten years previously were not protected against rheumatic fever nor against rheumatic heart disease. I believe that tonsils should be removed no more often in rheumatic children than in any other group. Tonsillectomy, then, does not solve our problem.

I believe I have already indicated that sending these children to a school like Dowling does not give us a satisfactory result. This type of treatment has been provided for rheumatic children in many cities in this country. It is my opinion that schools of this kind are suitable for children with advanced cardiac disease who are unable to attend regular school because of lack of physical reserve. These schools could also be used to enter children who had just returned from a prolonged stay in bed. Children could be admitted to such a school for a semester to try them out to determine whether or not there were still any signs of continued activity. But this type of school is not satisfactory for the recent post-rheumatic child. It does not protect him. It permits activity to go on and allows continued crippling of the heart.

Not having any specific type of therapy for this condition and aware of the fact that rheumatic fever, like syphilis, smoulders for years, insidiously producing increasing destruction, I am thoroughly in agreement with the English investigators when they say that the only possible method of preventing this prolonged infection is to put these children to bed for a period of months, six months on an average, until all signs of activity have ceased. I had the opportunity of visiting some of the institutions the English have provided for their rheumatic children. They call them residence hospitals. I believe a better name would be convalescent homes or preventoriums. At Carshalton, a short distance out of London, is located Queen Mary's Residence Hospital, where about 350 rheumatic children are being provided with prolonged rest in bed in the best environment. The hospital is located in a beautiful garden spot in the country. It consists of a number of small units all built on one floor. The buildings are constructed so that the beds can be rolled out into the sunshine, when the sun shines in England. In cloudy weather ultraviolet therapy is provided by lamps. Nutrition is kept up by the best of food. The children are arranged according to age and stage of activity of the disease, giving a rather uniform group for teaching purposes. Each ward is a classroom presided over by a most efficient teacher. These children continue their school work even while they are flat in bed. They are kept in bed from one to three months until all signs of rheumatic activity have disappeared. They are then permitted to sit up a little more each day until they are finally out of bed and then spend a number of weeks in supervised outdoor activity. They do some gardening and are taken on walks of increasing distance. A number of these children are then transferred to a small convalescent home for a short stay at the seashore. Many of them go back to the schools for physically defective children, much like Dowling, and, if their condition permits, are finally transferred to their regular schools. This, to my mind, is an ideal régime for recent post-rheumatic children. I believe this type of treatment should be provided wherever there are enough rheumatic children, especially in a temperate climate like our own, where rheumatic fever is always present and where a large number of cases appear each year.

Of course, you will want to know immediately whether or not I can prove that this sort of convalescent treatment does help these children. Are they any better after they have been in bed from three to six months in such an institution? As yet there are no large collections of figures available. The oldest convalescent home for rheumatic children is probably not much over five years old. Dr. Thomson of Birmingham, who has been in charge of the Baskerville Convalescent Home since its origin five years ago, writes me that he has collected 500 cases of rheumatic children who have passed through Baskerville School but he does not see how it is possible to decide what the real value of such convalescent treatment is until a considerable period of years has elapsed. He hopes to review these 500 cases in another three or four years, when the children will all have mixed with the world on ordinary terms for at least ten years or more. However, he does state that "there is no doubt that the immediate results are very good."

Campbell and Warner in a recent article compared the results of treatment at the Carshalton Convalescent Home with those obtained in the group treated at home and as out-patients. Both groups were studied for at least a year in the out-patient department and the authors conclude as follows: "The number of relapses in the first three years was only half as many in the children who went to Carshalton as in those who did not. This is all the more striking when it is realized that originally they were more severe cases." I have also a letter from the English Ministry of Health in which they write as follows: "It will be observed that it is stated in the Annual Report of the Chief Medical Officer of the Ministry of Health that London is just completing new accommodations of 350 beds in addition to existing ones for the treatment of rheumatic troubles in children." The English investigators are agreed that convalescent care of rheumatic children is at present the only method of attempting to prevent rheumatic heart disease in children.

Considering the state of our present knowledge and aware of the fact that rheumatic fever is a prolonged insidious disease that slowly cripples the heart over a period of years, I am thoroughly in accord with the English opinion. McCullough of St. Louis wrote a short statement in a bulletin issued by the American Heart Association recently in which he recommends this sort of treatment. Another bulletin from the American Heart Association issued this week discusses the value of preventorium treatment of rheumatic disease. A number of convalescent homes have already been provided in this country and I am hoping that we will have one of our own during the next year. I believe these children are entitled to this kind of treatment; I do not believe that we should stand by doing nothing while we are waiting for some specific treatment which we all hope will be forthcoming in the very near future.

TUBERCULOSIS, A PUBLIC HEALTH PROBLEM*

H. A. Burns, M.D.
Superintendent, Minnesota State Sanatorium
Ah-Gwah-Ching, Minnesota

TUBERCULOSIS is a disease characterized by a specific etiology, a positive epidemiology, and an uncertain therapy. The tubercle bacillus bears a marked resemblance to other pathological organisms in that it is able to live in a favorable environment outside the human body for weeks and months and is resistent to direct sunlight for several hours and indirect sunlight for as many days without losing its virulence. It is able to withstand heat under all ordinary conditions as met in nature.

The epidemiology of tuberculosis depends upon the possibility of contact between the organism and a susceptible individual. Experience has taught us that the infection, once introduced, may remain a local unrecognized and unidentified lesion causing no symptoms and attracting no attention for weeks and months before the onset of prodromal symptoms or the arrival of the day of breakdown. Experience has taught us that this period of initial infection is the time to diagnose tuberculosis in the hope of curing the patient and saving a healthy body from chronic invalidism.

The epidemiology of tuberculosis is most concerned in the source of original contact with the positive sputum case. The more intimate the association with the open case in the community, the greater is the incidence of infection.

INCIDENCE OF INFECTION

The following investigators have reported various percentages of infection in different age periods and groups:

Armstrong[1] (Framingham): 15 per cent second year of life; 45.7 per cent from 6 to 7 years; 54 per cent from 7 to 15 years.

Lampson[6] (Minnesota): 2.5 per cent in non-tuberculous families; 22 to 33 per cent in tuberculous families; 67 to 100 per cent in families with open cases.

Slater[9] (Minnesota): 5 per cent in children without family history; 8 per cent in children with questionable history; 88 per cent in children with positive family history.

Leigh[7] (Texas): 82 per cent Mexican school children.

McCain[8] (South Carolina): 22.59 per cent school children.

Ferguson[4] (Canada): 93 per cent Indian school children; 54 per cent general school population.

Heimbeck,[5] in the study of 420 nurses, found that 220 showed negative reactions at the time of admission. Soon after being placed on tuberculosis service, they became positive reactors.

Heimbeck states, "As far as the rest of the nurses who originally gave a negative reaction to the Pirquet test are concerned, only one of the 1924 class, two of the 1925 class, and six of the class of 1926 still gave a negative reaction. It can now be stated as certain that in the course of one or two years, the reactions of practically all of those who formerly gave a negative reaction to the Pirquet test have become positive and about twenty per cent of them have contracted a tuberculous infection."

The school survey and epidemiological investigation of tuberculosis in infected communities have shown that a large percentage of uninfected young people annually leave their homes and go out into the world to earn a livelihood. These uninfected young men and women under present conditions must frequently and unconsciously come in contact with open cases of tuberculosis. The results of observation at this time indicate that the uninfected youth or adult upon becoming exposed is in danger of developing clinical tuberculosis.

The problem of resistance and allergy must be considered in relationship to the original exposure and to repeated exposure in this class of susceptible contacts. From an epidemiological point of view it does not matter greatly to which view concerning this question one adheres. For control purposes it is necessary to keep the uninfected and the infected non-clinical case from contact with the positive sputum carrier.

---

*Read before the Minnesota State Sanitary Conference, Saint Paul, December 8, 1930.

Both groups have been shown capable of developing parenchymal tuberculous lesions.

Epidemiology has demonstrated the occurrence, in communities, of areas heavily infected with tuberculosis. Such areas should receive special attention from those engaged in tuberculosis control.

Chadwick[2] says, "Different sections in the same city may show a wide variation in the percentage of reactors. It was found that in one city of 60,000 that the number of children reacting to the tuberculin test in different school districts varied from 11 per cent to 60 per cent."

Zimmerman[11] has found that the tuberculosis infection fluctuates from one year to another. Over a period of four years, it was found to vary from 58 to 77 per cent.

The migratory carrier is an ever present problem in tuberculosis control. The Minnesota State Board of Health[10] reports concerning this group of cases during the ten years 1920 to 1929:

1690 cases left Minnesota for residence elsewhere
1848 cases entered Minnesota and were examined in one clinic
638 cases came to Minnesota to reside
4396 reciprocal notifications in Minnesota during ten years time

It is essential in the control of any contagious disease to know where and when and under what conditions it occurs. Without these data epidemiology is helpless; with them, however, the most costly disease to both life and treasure resolves itself into a simple formula.

During the years 1918 to 1927, among 18,880 fatal cases in Minnesota 6,565 (34 per cent) were not reported as provided by law previous to the time of death. In 1929 there were 1,441 deaths, 547 (37 per cent) of which were first reported by death certificate.

During the five year period from 1925 to 1929, the forty-seven counties in Minnesota not supporting sanatoria reported 3,967 cases of tuberculosis to the State Board of Health; 937 (23 per cent) were reported by death certificate only.

The remaining forty counties supporting county sanatoria and containing over 65 per cent of the total population, reported 15,398 cases of tuberculosis of which 1,793 were reported by death certificate only.

Of the cases reported by death certificate only 27.9 per cent came from Hennepin, Ramsey, and St. Louis counties; 37.7 per cent from the thirty-seven remaining counties supporting sanatoria. Of cases reported by death certificates only, 34.3 per cent were from the forty-seven counties not supporting county sanatoria.

Table I
CASES REPORTED BY DEATH CERTIFICATE ONLY IN MINNESOTA

	Per cent
1925	26.38
1926	26.94
1927	34.45
1928	32.35
1929	38.02

It is not evident from these data that the county sanatoria are aiding materially in getting cases reported. However, the public sanatoria have not yet fully appreciated their duty to the communities they serve, since there is little if any attempt made to trace tuberculosis infection. The sanatorium is created by the community to reduce the incidence and control the spread of tuberculosis. The sanatorium must choose to become a part of the epidemiological control of tuberculosis, or it will become more and more an institution concentrating upon therapy.

If treatment is overemphasized and epidemiology neglected, the sanatorium cannot escape the criticism of practicing "State Medicine."

The cases reported and deaths occurring during 1923 to 1928 in age groups show an absence of the application of prevention most noticeable in the age group under five and less so from five to nineteen. The reporting of cases improves in the higher age level and is most complete at 65 and over, where it is of least value.

The majority of tuberculosis infections occur in the lower age groups; yet only a small number of cases are reported in this age group. The accompanying chart shows that under five years of age there were 734 cases and 493 deaths. From five to nineteen, there were 3,804 cases and 1,071 deaths, and from twenty to sixty-five and over, there were 18,546 cases reported and 8,306 deaths.

The industrial and reproductive ages contribute greatly to both case and death rate, yet the pre-industrial age is the period during which much of the exposure and infection occurs. One group should be protected against the other.

During this period up to thirty-five years when infection and allergy are being acquired, there were 5,275 deaths, with 4,559 deaths oc-

TABLE II

MINNESOTA DEPARTMENT OF HEALTH

Division of Preventable Diseases—Division of Vital Statistics

Issued September 9, 1929

Total Tuberculosis Cases and Deaths

	1923		1924		1925		1926		1927		1928	
	Cases	Died	Cases	Died	Cases	Died	Cases	Died	Cases	Died	Cases	Died
Under 1	47	41	36	26	39	27	31	26	37	27	28	21
1	36	32	33	33	20	15	35	29	20	15	22	21
2	39	19	21	10	14	6	17	10	18	17	23	18
3	19	14	21	12	22	5	15	10	15	6	15	10
4	35	15	10	3	24	8	16	10	15	4	11	3
Under 5	176	121	121	84	119	61	114	85	105	69	99	73
5-9	163	30	143	27	132	23	123	27	152	19	96	16
10-14	191	40	190	35	177	33	190	32	189	40	147	32
15-19	353	145	360	126	324	108	302	122	325	108	277	108
5-19 Total	707	215	693	188	633	164	615	181	666	167	490	156
20-24	625	242	660	234	585	214	556	216	568	223	493	174
25-34	1279	476	1425	461	1148	399	1005	379	1050	402	917	325
35-44	656	347	710	306	645	312	629	307	605	252	591	270
45-54	356	219	342	190	344	193	358	206	374	209	387	195
55-64	219	138	208	138	182	126	238	169	206	126	248	142
65 and up	143	98	135	104	145	123	179	143	161	121	174	126
TOTALS	3278	1520	3480	1434	3049	1367	2965	1420	2964	1333	2810	1232
Unknown	181	0	155	2	164	0	136	0	156	1	105	0
GRAND TOTAL	4342	1856	4449	1708	3965	1592	3730	1686	3735	1570	3504	1461

curring in the higher age levels. Concentration of effort to the end that all cases be reported promptly and that control measures be instituted effectively will result in the prompt identification of the infected among the younger age groups together with the prompt isolation of cases in the later ages, thus reducing the number of cases and deaths in the earlier ages. The effect of epidemiological control will be noticed first through the lowering of the case and death rate throughout the lower age level.

During the past five years twenty-five cases of hilum disease (first infection) were admitted to the Minnesota State Sanatorium from the fifty unorganized counties. While this futile attempt was being made to care for cases of juvenile tuberculosis, 1,937 deaths, in children and adults, actually occurred among the residents of these counties. Sixty-two teen age cases were admitted from these unorganized counties during this period.

To control tuberculosis we must not only gather our data, but we must apply the knowledge derived from them. With the physical equipment now available to fight tuberculosis, with the accumulated epidemiological knowledge waiting to be put into service it is possible to bring under control the easiest of all communicable diseases, pulmonary tuberculosis.

CONCLUSIONS

It is apparent that if our anti-tuberculosis work follows a progressive program, future effort must be largely devoted to the epidemiological study of tuberculosis.

The valuable information accumulated by the State Board of Health must not be allowed to lie dormant. The prompt application of knowledge now available will go far towards successful control. In fact the ultimate control of tuberculosis is dependent upon our opportunity to accumulate, to study, and to apply statistical and epidemiological data to the problem.

The sanatorium as a public institution must serve for purposes of control. To do so it must concentrate upon epidemiology rather than upon therapy.

A study of the data supplied by the State Board of Health would seem to indicate that the sanatorium, except for isolating the positive sputum case, has made no marked contribution towards the control of tuberculosis.

We must emphasize in the future more contact with the environment that is permitting tuberculous infection to spread, rather than more equipment for the clinical care of the one already broken if our objective is to control and our efforts are to end in a minimum case rate and a residual death rate.

It is not the periodic examination that is necessary in order to detect early tuberculosis but rather epidemiological investigations of exposed groups and communities that early infections may be identified, that gives a promise which commands our consideration today.

The public sanatorium must become a part of the epidemiology of tuberculosis. Effective coordination between these two activities will accomplish where either alone must fail.

REFERENCES

1. Armstrong, D. D.: The Framingham health and tuberculosis demonstration. Am. Jour. Pub. Health, 7:318 (March), 1917.
2. Chadwick, Henry D.: The incidence of tuberculosis infection in school children. New Eng. Jour. Med., 200:332 (Feb. 14), 1929.
3. Chesley, A. J.: Executive Secretary, Minnesota State Board of Health (Personal Communication).
4. Ferguson, R. G.: A tuberculosis survey of 1,346 school children in Saskatchewan. Tr. Natl. Tuberc. Assn., 18:330, 1922.
5. Heimbeck, Johannes: Immunity to tuberculosis. Arch. Int. Med. (March 15), 1928.
6. Lampson, Herbert (University of Minnesota): A study on the spread of tuberculosis in families, 1913.
7. Leigh, Harry: A study of apparently healthy children of school age who are highly sensitized to old tuberculin. Texas State Jour. Med. (Dec.), 1925.
8. McCain, P. P.: A report of the study of 25,048 school children for tuberculosis. So. Med. Jour., 22:310 (Apr.), 1929.
9. Slater, S. A.: The results of Pirquet tuberculin tests on 1,654 children in a rural community in Minnesota. Am. Rev. Tuberc., 10:299 (Nov.), 1924.
10. Statistical data furnished by the Minnesota State Board of Health.
11. Zimmerman, R.: The occurrence of children who are not sensitive to tuberculin in tuberculous families. Ztschr. f. Kinderh., Berlin, 39:692, 1925.

OUR STATE INSTITUTIONS

THE FEEBLE MINDED, BLIND AND DEAF*

J. M. Murdoch, M.D., Superintendent Minnesota
School for Feeble Minded
Faribault, Minnesota

The Minnesota State Board of Control conducts eighteen State Institutions for the mentally ill (insane), the mentally defective (feeble minded), the epileptic blind, deaf, delinquent, tuberculous and crippled. The total population of these institutions is about 15,000.

The Journal of the American Medical Association in its hospital number, issued March 29, 1930, in tabulating the number of beds and patients in hospitals, reports as follows:

GENERAL HOSPITALS

	Number of Hospitals	Beds	Patients
Minnesota	164	10,796	7,080
United States	4,268	357,034	234,009

NERVOUS AND MENTAL HOSPITALS

	Number of Hospitals	Beds	Patients
Minnesota	15	10,627	10,281
United States	572	414,386	395,407

There are more patients in hospitals for mental and nervous disorders than in all the general and other special hospitals combined.

The hospitals for mental and nervous disorders, including the feeble minded and epileptic, are crowded to capacity, and their population is increasing at a rate much faster than the increase in the general population.

In the United States today, at least 1,000,000 people are social liabilities because of mental disorders. Seventy-five thousand people are walking the streets today who will be in institutions for mental patients within a year, and of these, 1,500 are in Minnesota, and will be seen by physicians of this State.

There are 67,000 feeble minded under training and treatment in institutions in the United States. Of these 2,050 are in the Minnesota School.

These statistical findings are conclusive evidence that our handicapped citizens constitute a tremendously important medical, social and economic problem.

THE FEEBLE MINDED

The Minnesota School for the Feeble Minded, situated in Faribault, was established in 1879. It has accommodations for 2,050, and is always filled to capacity. The institution, as its name implies, is primarily a school —a school for the training of children who, on account of mental defect, are unable to receive appropriate instruction in the public schools.

By the use of psychological test criteria, it is possible to select these children with a considerable degree of confidence and plan for their future training.

It is unjust to compel these handicapped children to compete intellecutally in schools designed for those who possess normal mental endowment.

Where the child is definitely feeble minded and cannot receive adequate care and supervision in the home, or where a special class is not available in the public schools, the child should be sent to the institutional school when six or seven years of age.

At present, far too many feeble minded children, particularly girls, are not sent to the institutional school until quite grown up, and then only after they have acquired anti-social habits, difficult or impossible of eradication. For these the possibility of successful social adjustment for life outside of the institution is materially lessened.

However, children sent to the institutional school, should be a selected group. This group should consist of those who exhibit symptoms of social maladjustment in which the environmental influences are difficult to modify, and are fostering the development of unfortunate personal reactions.

With an intelligence quotient above .50, where home conditions are satisfactory, and a special class in the public school is available, the child should not be sent to the institutional school unless he gives evidence of anti-social conduct which cannot be controlled at home. The extremely helpless child (with an intelligence quotient below .25) can frequently be cared for quite as well at home as in the institution.

On admission each child is given a thorough mental and physical examination.

In school he is assigned to tasks well within his capacity. Instruction is of practical type, proceeding at a speed commensurate with ability. Periods of study are short, with frequent intermissions for recreation. Industrial work predominates, as it is in manual training these children do best. Much individual attention is necessary, requiring instruction in small groups.

The task is fitted to the child, and not the child to the task. Girls are taught all branches of house work. Many become experts with the needle. Boys are trained for simple industrial work in the shop or on the farm.

Every pupil is given an opportunity to go as far in academic school work as his capacity permits. However, few go beyond the fourth grade. Good social and industrial habits are formed.

Pupils in the higher grades who have a mental development over eight years are trained for life outside of the institution. After appropriate training, many of these become stable in their habits and are successfully employed at manual labor on farms or in simple industrial operations.

Where the condition is due to hereditary defect, a sterilization operation is performed, after which the child may be returned to the home, or where home conditions are not satisfactory girls are sent to club houses, maintained by the State Board of Control. These club houses are home-like, attractively furnished, each caring for from twenty to twenty-five girls, who live under the supervision of a matron, going out to work by the day. These girls are self supporting, and after paying for board, clothing and other incidentals they are encouraged to deposit any surplus money they may earn in a savings account.

---

*This and the following articles compose a symposium on Our State Institutions, presented before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 14, 1930.

Plans for the establishing of similar clubs for boys are being considered.

At present many of the higher grade boys are finding employment on farms. Sterilization has made it possible for many to be placed outside of the institution where this otherwise would not be considered.

For the lower grades, even after the training given at the school, few homes are able to give the constant supervision and the protection required. These remain in the institution where they live, happy and contented in their limited environment, at work and play with congenial companions of their own mental level, and supervised by attendants who appreciate their limitations.

As to the causes of mental defect, our records show that about one-half of those admitted have near relatives similarily afflicted. We have nine brothers and sisters from one family, and many family groups of three, four and five.

As to the other one-half, where there is no history of mental defect in the family, a large number are the end-results of infection, and trauma. Encephalitic and meningitic involvement may be complications of infectious diseases including those not primarily affecting the central nervous system. That encephalitis may be a complication of measles and other exanthemata has been conclusively demonstrated at autopsy. Microcephalus may follow the irradiation of the pregnant uterus. Obstetrical accidents, and accidents later in childhood, resulting in severe head trauma, make their contribution.

Syphilitic parentage frequently is antecedent to a low grade encephalitis resulting in feeble-mindedness.

Sterilization as carried on at the Minnesota School for the Feeble Minded is more than a eugenic measure.

Feeble minded persons do not make good parents, regardless of the mentality of their offspring. Sterilization is useful as a measure for insuring a better social adjustment and is of constructive value in the rehabilitation of the trained defective.

Under the parole plan, subjects deemed suitable for life outside of the institution are sent out on trial, remaining under the continuing supervision of the State Board of Control.

The Minnesota School for the Feeble Minded is always filled to capacity, and new cases are admitted as rapidly as possible from the waiting list of those committed by a Probate Court to the guardianship of the State Board of Control.

Before a feeble minded person can be admitted to the institution, he must first be committed as a feeble minded person to the guardianship of the State Board of Control.

THE BLIND

The Minnesota School for the Blind is maintained by the State, under the direction of the State Board of Control. The superintendent is Professor J. E. Vance.

The school is attractively located in a park on a high bluff, overlooking the city of Faribault. Its opportunities are free of charge to all blind persons in Minnesota between the ages of six and twenty-one, who are capable of profiting by instruction. Forms for making application for admission may be obtained by addressing the superintendent.

By a blind person is meant one who has not sufficient sight to receive satisfactory instruction in the public schools.

Eight years is the regular period of instruction, but at the expiration of that time an additional period of four or five years may be granted.

The work of the school is conducted in three departments, the literary, music and industrial.

There is very little formality for the admission of a pupil to the School for the Blind. After the first admission the child returns to the school year after year in the same way he would return to the public school, continuing in the school, year after year until he completes the course and leaves upon graduation.

The Literary Department, or school proper, has a primary course of four years, an intermediate course of four years, and a higher course of four or five years. The instruction includes kindergarten training and the branches usually pursued in the graded and high schools for normal pupils.

In the Music Department, instruction is given upon the piano, the pipe organ, the violin, and other orchestral instruments; in individual and class singing and in the theory and history of music.

In the Industrial Department the boys are taught piano tuning, and repair and adjustment of piano players, and broom making. Both boys and girls are taught weaving, chair-caning and various forms of manual training, including cabinet work, basketry, hand and machine sewing.

The graduates from the school are well equipped to become self-supporting citizens.

THE DEAF

The Minnesota School for the Deaf is maintained by the State, under the direction of the State Board of Control. The superintendent is Mr. Victor O. Skyberg.

This school is beautifully located in Faribault. The buildings are attractive in appearance and well equipped. Its facilities are free to all the deaf children within the State between the ages of seven and twenty. Forms for making application for admission may be obtained from the superintendent of the school.

This school, as is the school for the blind, is a part of the general educational system of the State. The purpose of the school is to give the deaf children, mental, moral, physical and industrial training, that will make of them useful and productive citizens. At the present time there are 275 pupils in attendance.

A deaf child allowed to grow up without an education is a most pitiful object and unhappy burden upon society. The same child given the education this school provides becomes a happy and useful citizen. The child should enter the school at the age of seven years. That the instruction and training given at this school are successful is borne out by the results obtained.

The graduates of this school are all, without exception, self-supporting citizens. They are found in eighty-five different occupations which cover the professional and commercial field, and the skilled occupations of industry.

The trained deaf person has a salable service.

No blind or deaf child should be permitted to grow up in this State without having the advantages freely provided at these most excellent schools.

OUR TUBERCULOSIS SANATORIA

Arnold Anderson, M.D.
Saint Paul

It is still not a pleasant duty to be called upon to make a diagnosis of pulmonary tuberculosis; for the doctor, as judge, must impose upon the patient a sentence of prolonged bed rest and a period of personal discipline. It is a sentence which carries with it the curtailment of most of the ordinary pleasures in life: a renouncing of physical activity: a period of self-denial. These sacrifices which appear so crushing in their application are the price that must be paid by the patient of today for a recovery from tuberculosis. In former days, however, the outlook was infinitely more forbidding. The physician making the diagnosis felt deply the helplessness of the situation, for he viewed tuberculosis as a slowly creeping, relentless and exacting disease which held death as its price. The sanatorium has done much to change this ghastly picture. With the advent of tuberculosis sanatoria, the physician has come more and more to realize the curability of consumption and so to imbue his patients with higher hopes and greater assurance.

It was while the sanatorium idea was still comparatively new that Minnesota received its first introduction to it. This came through the wisdom and foresight of a certain socially minded physician, Dr. H. Longstreet Taylor. To this man, more than any other single individual, must go the credit and glory for establishing our Minnesota system of tuberculosis sanatoria, a system which has met with nationwide comment and approval.

Many of you here today can recall the Minnesota legislative session of 1901 when an act was passed providing for the appointment of a commission to investigate the advisability of establishing a State Sanatorium for Consumptives. The Honorable S. R. Van Sant, then governor, appointed to this commission three physicians: Dr. J. L. Cemp, Dr. G. S. Wattam and Dr. H. L. Taylor. After many months of investigation and study, this commission reported in a very effective way to the 1903 legislature advising the establishment of a State Sanatorium at Walker, Minnesota. The advice was heeded with the result that in 1908 the doors of the first sanatorium in Minnesota for tuberculous patients were opened. The example of the state was soon followed by St. Louis County, which, acting under the authority granted by the 1909 legislature, established the first county sanatorium in our state. Otter Tail County followed suit and in 1913 completed its institution for the tuberculous. Following this, through the efforts of the State Advisory Commission headed by Dr. Taylor, the 1913 County Sanatorium Law was passed. Briefly stated, this law provided that to any county or group of counties erecting a tuberculosis sanatorium according to standards set by the Advisory Commission the state would lend its support to the extent of one-half the cost of the sanatorium, up to the sum of $50,000.00. The law further provided that the state would help in maintaining the institution by paying to it $5.00 per week for every resident free patient which it housed. This law proved to be a great boon, for soon after its passage one sanatorium after another made its appearance. At the present time, we have 14 county, 1 state, 2 federal and 3 private tuberculosis sanatoria in the state. Besides this, beds for special tuberculous patients are had in the following state institutions: University Hospital—12 beds; Rochester State Hospital—38 beds; St. Peter State Hospital—55 beds; Hastings State Asylum—3 beds; Colony of Epileptics, Cambridge—8 beds; Minnesota School for Feeble Minded—22 beds; Fergus Falls State Hospital—73 beds; State Prison—12 beds; Minnesota State Reformatory—7 beds. In all, we have a total of 2,616 beds for the care of our tuberculous patients.

Of late, it has been our endeavor to interest the non-sanatorium county in affiliating with an already existing institution. Forty of the 87 counties in the state are so affiliated. They have a convenient, necessary and valuable way to care for these patients and it is safe to say that these communities are the better served because of it.

I will be brief as to the method of operation of our county sanatoria. The Minnesota plan carries with it a check and double check system. Locally, the institution is governed by the sanatorium commission, whose function is to hire or discharge the superintendent and to approve of all bills and expenditures. Centrally, the various sanatoria are responsible to the State Board of Control (which in 1925 took over the duties of the Advisory Commission) for the operation of an institution which must measure up to certain set standards. Failure to do so gives the Board of Control authority to remove state aid to that sanatorium. In having both a local and central body interested in the welfare of the institution, there is given a certain stability and order to our system which other plans lack.

You are all acquainted with the ordinary functions of our sanatoria, as places of isolation for the infectious tuberculous patient and as institutions for the modern care and treatment of tuberculosis. It is necessary, however, to go further than that in combating a communicable disease. There is great need to give to the community which is served a true and proper understanding of an infectious disease. For that reason, we like to view our sanatoria as health educational centers which by newspaper articles and other ways try to instill into community life a better appreciation of health. During the past two years, short courses in tuberculosis have been held at many of our institutions in order to give to the busy medical practitioner the newer knowledge gained in the control of tuberculosis. These courses have served a valuable purpose.

They have brought the sanatorium and the private physician into closer contact. It has resulted in an exchange of ideas which has proved mutually beneficial.

I cannot close these brief remarks without extending to you a freer use of our sanatoria; a welcome to our many facilities. The institutions are a part of your community paid for and supported by your taxes, built and maintained to give you service and existing for the purpose of bettering community health. Our sanatorium system was born of the medical profession. It must be nourished by the same body in order to thrive and prosper until its work is done.

EPILEPTIC COLONY

D. E. McBroom, M.D.

Cambridge, Minnesota

It is not my intention to tell you anything about epilepsy, as this is a disease with which you are all thoroughly familiar, but will confine my few remarks to the methods in use, in admitting and discharging these patients to and from your State Institution.

The path of the epileptic is a very turbulent one, and has so many ramifications that the different types of patients we encounter in this field might fit into any of the classifications of mental diseases or sociology. As we all know, epilepsy is a progressive, degenerative process, so that the majority of epileptic patients sooner or later degenerate sufficiently to become feeble minded. It is also true that a very large percentage of epileptics are afflicted with psychosis of some kind which makes them follow the path of the insane, and, owing to the inferiority complex which is nearly always present, many of them become delinquent. Then, due to their instability, practically all are dependents. Thus you see the care of the epileptic covers a very broad scope.

The State of Minnesota has for many, many years taken care of the epileptic patients in the School for the Feeble Minded at Faribault. Owing to the crowded conditions there and realizing that the high grade epileptic and the feeble minded patients were more or less incompatible, the State Board of Control saw fit to establish a separate Colony for Epileptics in 1925. This was located at Cambridge, where we have all new bulidings, the latest type of construction and particularly well adapted to the handling of this type of patients, and, while new, the institution has made remarkable progress since it was organized.

Minnesota has no separate law governing the commitment of the epileptic patient. At the present time we have two separate and distinct procedures which are followed in this state. The first and most efficient and the one which covers the vast majority of cases is that of commitment of the epileptic to the custody of the State Board of Control as feeble minded. By this method the family, relatives, or anyone who is a resident of the state may file complaint and it becomes the duty of the Judge of the Probate Court to set a time for the hearing. At this hearing, the County Attorney represents the patient and it is his duty to see that the patient is given a fair trial or hearing. Two regularly licensed physicians are called who serve as examiners and assist the Judge in making his decision. If the patient is found to be feeble minded to the extent of having an intelligence quotient of .70 or below, he is then committed by the Probate Judge to the custody of the State Board of Control. The State Board of Control then assigns this patient to any one of the institutions under their jurisdiction, which seems best adapted to the needs of this particular patient, and his name is placed upon the waiting list and is usually called for in the regular order of commitment, although there may be times when the Board of Control may use its discretion and advance a case a little ahead of his turn; but this procedure is applied only under very extenuating circumstances. The other method of admission to the Colony is that of the voluntary patient. In these cases we insist that the I. Q. be above .70 with a clean cut diagnosis of epilepsy. Under these conditions an epileptic patient may place an application for voluntary admission, signing a blank to abide by all the rules, laws and regulations of the State Board of Control and the institution, and his name is then placed on the waiting list to be called in his turn. The State Board of Control through the Children's Bureau has the handling of the waiting list and takes care of these patients as rapidly as possible, but no preference is given to the voluntary patient over those committed by court. The patients who have been committed to the guardianship of the State Board of Control are held in the institution until discharged or paroled by the State Board of Control. There is no sentence given, nor is a patient discharged by reaching any certain age limit, and of course any discharges because of a cure are practically nil, so that the vast majority of epileptics are assigned to the institution for the rest of their lives, unless they have a cessation of spasms for a number of years with a minimum amount of degeneration, when they may be released by order of the Board of Control. In the case of the voluntary patient, the release is an entirely different procedure. The voluntary patient has only to make written request for his release to the Superintendent of the institution and we have no way whereby we can prevent him from leaving. However, we request that he give us three days' written notice so that he will not be walking out of the institution when he is momentarily upset because of recent spasms or some other irritating circumstances. Very few patients qualify for voluntary admission, as nearly every epileptic who has had seizures for any prolonged time has degenerated sufficiently to place him in the court commitment class.

To summarize, I wish to say that the matter of all admissions and dismissals of all court cases lies entirely with the Board of Control and that only the question of discharge of the voluntary patients is left to the judgment of the superintendent. Upon admission to the institution all patients are treated alike regardless of the method of commitment. No special favors are granted to the voluntary patients although many of them arrive at the institution with this idea firmly imbedded in their minds.

In closing, I wish to state that the Minnesota Colony for Epileptics is located in the Village of Cambridge on Highway No. 5, forty miles north of Minneapolis, and we would be very glad indeed to have any and every member of the association visit the institution at any time they may see fit and see what your State is doing for this group of unfortunates.

GILLETTE STATE HOSPITAL FOR CRIPPLED AND DEFORMED CHILDREN*

Carl C. Chatterton, M.D.
Saint Paul

The care of the maimed, crippled and deformed has been a social problem since the beginning of time. Early laws before Christ regulating the care of crippled children are examples of extreme cruelty. In Rome, by law, the father of a crippled child could dispose of the child as he thought best. The Spartan mother when her child was born a cripple knew he would not become a good soldier, so she destroyed him.

About 600 A. D. cripples were tolerated in Italy principally because they were used for amusement as court jesters and objects of charity. Deformed and crippled children were used as a means of obtaining money, and if they were not deformed enough the parent or guardian saw to it that his charge was so deformed that he would make a pitiful sight and in that way secure money by begging.

Custodial or asylum care was given in England about 1600 and was established by Queen Elizabeth.

The first real school or training for crippled children was started nearly three hundred years later by Father John Nepimak in Munich. His school was the first to combine care and industrial instruction. In 1872 the first real industrial school was established by Pastor Hans Knutsen in Sweden.

In the United States, the care of crippled children is comparatively new. In 1844 the first American Home for the care of crippled children was established in Philadelphia. The first orthopedic hospital was established in New York City in 1863. In 1866 the second orthopedic hospital was established in New York. The first school for crippled children in the United States began in Boston in 1893.

The first legislation by any state in the United States for the care of their crippled children was in Minnesota in 1897.[1]

The exact date in the minds of those interested in the founding of a hospital for indigent, crippled and deformed children perhaps will never be known. The first records of the need of such an institution in this State are found in the proceedings of the Fifth and Sixth Minnesota Conference of Charities and Corrections.[2] In the year 1896 Jessie Haskins, a slender, crippled girl, read a paper before that body on the need of a state institution for the care of crippled and deformed children. The following year Dr. Arthur J. Gillette appeared before that body with a paper, The Duty of the State to Its Crippled and Deformed Children. This same year Jessie Haskins went before the State Legislature begging for the establishment of a state hospital and school in which other crippled children like herself, whose parents were too poor to pay for treatment, might be cared for and educated. Her plea brought action, largely because it was backed by an offer of free medical treatment and surgical care for all indigent children who might come. The offer of free service was made by Dr. Arthur J. Gillette, and the same year a bill was introduced and passed by the Minnesota Legislature providing a small sum for those who might come. Hasting H. Hart, then Secretary of the State Board of Charities and Correction, and later of the Russell Sage Foundation, gave his warm approval to the project.

The bill was not passed without effort, because at that time there was no such state institution or hospital for the care of indigent, crippled and deformed children, nor was there a law in the United States that could be used as a precedent, and the State Legislature was not anxious to take up with a new and untried institution or system.

The bill had but one object in view and that was the care, relief, cure and education of the poor, crippled children of Minnesota who, if not already so, would eventually become wards of the State. That the children would receive medical and surgical care without cost to the State was a surprise to the general State Legislature. On April 23, 1897, a law to provide for the care and treatment of indigent, crippled and deformed children was approved. The Board of Regents of the University of Minnesota was given power to act and $5,000.00 per year for the next two years was appropriated. The City and County Hospital, St. Paul, Minnesota, was the first home and gave a ward exclusively for the care of these children at a rate so low that it was possible in the first two years of the institution's existence to care for eighty children.[3] After the first two years, appropriations came easily and work increased so rapidly that the ward became filled and the necessity of a separate building became apparent. Grounds and a building adjoining the City and County Hospital were used and later given to the State by Ramsey County and the City of St. Paul.

In the year 1907, the City of St. Paul, Commercial Club, Business League, certain citizens, Mayor Smith, Senator W. W. Dunn, Dr. Robert Earl, Dr. Arthur J. Gillette and others gave the State twenty-three acres and $5,000.00 for cottages and improvements in the municipal Phalen Park where the Hospital now stands.

---

*Moving pictures were shown of the various activities, school rooms, social hours, recreation, operating rooms, class training and views about the grounds and hospital. These pictures of the various activities of the institution are available to clubs, medical societies, lay-gatherings without cost.

In this year the Board of Regents of the University of Minnesota asked release from control of the institution and the State Board of Control assumed charge.

In 1909, $55,000.00 was appropriated for the construction of a sanitarium at Phalen Park. In 1913, $60,000.00 more was appropriated for an addition to the sanitarium and in that year property of the State at the City and County Hospital was given back to the City of St. Paul and County of Ramsey and all the children were transferred to their present home at Phalen Park, St. Paul, Minnesota.

Since 1913 two large wings have been added to the institution. Gifts of a swimming pool and sun rooms are notable and worthy additions for treatment. The Michael Dowling Memorial Hall, a gift of the bankers and editors of the State, brings the present value of the entire institution over one-half million of dollars.

The present capacity is two hundred and fifty beds, requiring a personnel of one hundred and twenty-five to maintain the care of children. Forty medical men of St. Paul donate their services to carry on the medical and surgical service.

The institution as well as carrying on medical and surgical service endeavors also to give educational advantages to its inmates, and training is continuous the year around. Vocational training both in the institution and in nearby institutions is used as far as possible. Trades, dressmaking, arts, music, domestic science, are available to those who wish and need such service.

The institution is also used to advance medical knowledge. Three resident physicians are in attendance. Senior students from the University of Minnesota spend thirty hours at the institution for lectures and demonstrations. A training school for nurses for both undergraduate and postgraduate students is maintained.

BIBILIOGRAPHY

1. Minnesota State Laws of 1897, Chapter 289.
2. Proceedings of Fifth and Sixth Minnesota Conferences of Charities and Corrections.
3. State care of indigent crippled and deformed children. Arthur J. Gillette, M.D., St. Paul Medical Journal, 1900.

HOSPITALS FOR THE INSANE

Arthur F. Kilbourne, M.D.
Rochester, Minnesota

Minnesota was admitted to statehood in 1858.

The first of any provision for the care of its insane was in 1863 when fifty-five patients were sent to the Iowa hospital at Mt. Pleasant and some seven to St. Vincent's retreat in St. Louis. In 1866 the first hospital was opened in St. Peter, Dr. Shantz, the first superintendent, stating in his first report that he found "an old dilapidated hotel undergoing repairs" used as a temporary hospital. This was soon overcrowded with its 100 patients but some patients brought from a distance of 100 miles or more in an open wagon were crowded in with the rest rather than have them undergo the fatigue and exposure of the return trip home.

Dr. Shantz died while the permanent hospital was only outlined by its basement walls. He was succeeded by Dr. C. K. Bartlett and in 1869 the first ward in the permanent hospital was ready for patients. Dr. Bartlett was superintendent for twenty-four years, his successors being Dr. Harry A. Thomlinson, Dr. Robert M. Phelps, and Dr. George H. Freeman.

The Rochester State Hospital, originally intended for an inebriate hospital, was turned over to the Board of Trustees and opened in 1879. Dr. Jacob E. Bowers, superintendent till 1889, was succeeded by the writer.

The Fergus Falls hospital opened in 1892 as a Homeopathic hospital, remained as such till recently, when that medical distinction was dropped. Dr. Alonzo B. Williamson, the first superintendent, after two years service was succeeded by Geo. O. Welch, who, after an incumbency of thirty-six years, was succeeded by Dr. W. L. Patterson.

More room being needed, the asylums at Anoka and Hastings were opened in 1902 and the Willmar Hospital for Inebriates in 1912, but in 1917 transferred to the care of the insane, reserving a ward for inebriates.

Time prevents my paying a well deserved tribute to the men who in the early days, and at times under discouraging conditions, built up these institutions and labored for the best interests of their patients.

Patients are received into the three asylums only on transfer from the three hospitals, to which they are committed by the Probate Court or admitted on voluntary application.

Training schools for nurses were opened in the state hospitals in 1889, the first of any such schools in the state requiring a two year course and affiliation the third year with a general hospital. These are accredited schools.

During the biennial period ending in 1900, 1,600 patients were admitted to the state hospitals, which was 45 per 100,000 for each year. In 1920 the admissions for the previous two years were 2,800, or 55.4 per 100,000 for each year. For the two years ending in 1930, 3,000 patients were admitted, or 58.5 per 100,000 for each year. This shows an increase in the number of admissions to the state hospitals in the past ten years.

The number present in institutions has increased from 3,364 in 1900 to 7,439 in 1928 and there will be in all probability a continuous increase in the number to be cared for in institutions, necessitating constantly increasing accommodations.

STERILIZATION

Some twenty-five states have a sterilization law. California has sterilized some 7,000 insane patients. Minnesota has gone as far as the law will permit. Some changes could be made to permit an increase in such cases. The feeble minded are unmoral, not immoral, and the women of that class may be the victims of unprincipled men taking advantage of their condition; in their case constant supervision only can replace sterilization. California reports a decrease in promiscuity from 75 per cent to 8 per cent after operation.

It has been said that the number we can sterilize is only a drop in the bucket compared with the total number of mental defectives. If a few of such patients as migrated to Minnesota in 1856 had been sterilized or kept under constant supervision, there would not be now some 500 of their descendants to be cared for by the state or to augment the criminal class.

The members of the senior class of the University Medical School are now serving internships in the state hospitals. I think it is the consensus of opinion that a psychopathic hospital should be established at the University.

THYMOPHYSIN NOT ACCEPTABLE FOR N.N.R.

The Council on Pharmacy and Chemistry reports that Thymophysin is stated to be a preparation of posterior pituitary and thymus, manufactured by Fritz-Pezoldt of Vienna and is marketed in this country by the American Bio-Chemical Laboratories, Inc. Because the claims for its action were inadequate, it was necessary to subject Thymophysin to examination by accurate pharmacologic methods to see whether the claims made for it are justified or whether it might not be merely a weak pituitary extract. This study was made by Prof. Erwin E. Nelson of the Department of Pharmacology at the University of Michigan. He studied the action of Thymophysin as compared with pituitary and again the action of thymus in connection with pituitary. Nelson concluded that there is no unequivocal evidence that either oxytoxic or pressor activities of pituitary are altered by the simultaneous administration of thymus; that experimentally no difference could be found in the oxytoxic, or pressor activities of pituitary alone as compared with pituitary plus thymus; and that Thymophysin ampules contained only about 30 per cent of the strength claimed. The Council declared Thymophysin unacceptable for inclusion in New and Non-official Remedies, since it is an unscientific preparation marketed under false claims as to its essential action, as to its strength, and as to its safety for mother and child. (Jour. A. M. A., March 14, 1931, p. 860.)

SCAR-POX, AN ALLEGED CURE FOR SMALLPOX AND SCARLET FEVER

State and local health officials from Michigan to California have received a form-letter coming from the "White Laboratories" of Chicago, offering to send, on request, a free trial treatment of "Scar-Pox." Among the claims made for Scar-Pox were these: "Scar-Pox, the new and guaranteed remedy for scarlet fever or smallpox"; "Scar-Pox is the tested remedy for the cure of either dread disease, scarlet fever or smallpox"; "It is a vegetable compound, absolutely pure"; "It is guaranteed by the makers to absolutely cure either scarlet fever or smallpox in three days when used as directed." Health officials who received a sample bottle of Scar-Pox were informed that a further supply could be obtained at $15 per bottle. The A. M. A. Chemical Laboratory analyzed "Scar-Pox" and concluded that it was essentially a solution of commercial cream of tartar (about 0.6 Gm. in 100 c.c.). One of the most astounding features of modern civilization is the fact, verified daily, that any person, however ignorant of medicine or pharmacy, cut put up the most fantastically worthless mixtures and sell them as "cures" for some of the most serious diseases known, and there is no legal machinery for stopping it—unless the exploiter is so crude as to violate either the national Food and Drugs Act or the postal laws against fraud. (Jour. A. M. A., March 21, 1931, p. 883.)

CASE REPORTS

TREATMENT OF ADDISON'S DISEASE BY THE CORTICAL HORMONE OF SWINGLE AND PFIFFNER*

REPORT OF CASE

ARTHUR R. KINTNER, M.D.
and
ROSS M. LYMBURNER, M.D.
Fellows in Medicine, The Mayo Foundation
Rochester, Minnesota

The cortical hormone prepared by Swingle and Pfiffner has been used at The Mayo Clinic on the medical service of Dr. L. G. Rowntree in the treatment of five patients with Addison's disease. The first, second and third cases were reported in *Proceedings of the Staff Meetings of The Mayo Clinic,* the fourth case is included in the series of cases reported by Dr. Rowntree at the recent meeting of the American Chemical Society, and the fifth is the subject of this report.

A housewife, aged thirty-six years, presented herself at the clinic for the first time April 14, 1928, because of symptoms of palpitation, dyspnea, weakness and nervousness of two years' duration; the symptoms had become progressively worse. A brownish pigmentation of the skin, typical of Addison's disease, had been present for about a year. Within the year numerous black freckles had appeared over the face, back and hands. The mucous membranes of the cheeks and gums were mottled with a bluish-brown discoloration. The skin was moist, smooth, of fine texture, and closely fitting. Although there had been a loss of 24 pounds in weight, it was not evident to the examiner. The patient had been unable to work for two weeks. The systolic blood pressure was 110 and the diastolic was 73 in millimeters of mercury.

The patient was admitted to hospital and was given the Muirhead treatment. This consisted of epinephrine, 3 minims of a 1:1000 solution hypodermically three times a day, 6 minims by rectum two times a day in 2 ounces of physiologic sodium chloride solution, and desiccated suprarenal cortex, 3 grains three times a day with meals. The rectal administration of epinephrine was discontinued on the fifth day on account of tenesmus. The patient's condition had improved greatly. She felt stronger, her appetite increased, she was less nervous and had gained 2.75 pounds in weight. There was no appreciable change in pigmentation. The blood pressure remained at about the same level. After thirteen days she was dismissed with the advice to continue the treatment at home.

In the course of the next fifteen months the patient returned twice for examination. She had followed treatment faithfully, and each time there was evidence of improvement, as manifested by increased strength and endurance. On her second return to the clinic she reported that she had been able to do light housework without undue fatigue. However, she had lost 7 pounds in weight and there was no change in blood pressure.

On the patient's fourth admission, September 1, 1930, she gave the following additional history. In the previous January she had contracted a cold, which had persisted for several weeks. With the onset of this illness nausea developed and she vomited for about three weeks. She was confined to bed for two months, and improvement had been exceedingly slow. During this illness she had been unable to administer her own treatment, and as a result had discontinued it entirely. She appeared considerably older than on her visit nine months previously. She was markedly depressed, extremely weak and exhausted, and dyspneic on the slightest exertion or excitement. Because of weakness a general examination could not be completed at one time. There was little, if any, change in pigmentation. She had lost 12 pounds in weight. The systolic blood pressure was 102 and the diastolic 64.

The patient was in the hospital for seven days. The first four days she did not receive treatment. During this time metabolic studies were carried out. On the morning of the fifth day, treatment with the cortical hormone of Swingle and Pfiffner was begun. The first and second day of treatment 7.5 c.c. was given intravenously, three times a day, and on the third day two doses of 7.5 c.c. each were given. There was no untoward effect from these injections.

The morning treatment was begun, the patient was in a state of complete exhaustion and mental depression. Anorexia was marked and she vomited her morning meal. That evening there was little, if any, change in her condition. The following day progressive improvement was noted. Her strength had increased, depression was less evident and she had regained her appetite. The morning of the third day of treatment there was no doubt that a complete change had taken place. There was a general feeling of well-being and a remarkable increase in strength and endurance. After her morning bath and a brisk walk along the corridor she had no feeling of dyspnea or exhaustion. She volunteered the information that she had never felt better in her life, and was positive that she could return unaccompanied to her home about 200 miles distant. Within a period of forty-eight hours this patient had undergone a change such as she had not experienced with any other form of treatment. To evaluate the continued effect of treatment we were desirous of observing her for a longer period of time. However, circumstances were such that she was obliged to return home. A letter from her twenty-two days later stated that the trip home was very hard, but at the time of writing she was feeling well and working every day.

---

*Work done in the Division of Medicine, The Mayo Clinic. Submitted for publication November 1, 1930.

COMMENT

The results in this case, and those in other cases in which the cortical hormone of Swingle and Pfiffner has been used, make it appear that progress has been made in the control of the crises of Addison's disease.

REFERENCES

1. Pfiffner, J. J., and Swingle, W. W.: The preparation of an active extract of the suprarenal cortex. Abst. Anat. Rec., 44:225 (Dec.), 1929.
2. Rowntree, L. G., Kintner, A. R., and Lymburner, R. M.: The use of Swingle and Pfiffner's cortical hormone in Addison's disease. Proc. Staff Meet., Mayo Clinic, 5:216-219 (Aug. 6), 1930.
3. Swingle, W. W., and Pfiffner, J. J.: Experiments with an active suprarenal cortex. Abst. Anat. Rec., 44:225-226 (Dec.), 1929.
An aqueous extract of the suprarenal cortex which maintains the life of bilaterally adrenalectomized cats. Science, 71:320-322 (March 21), 1930.
Further observations on adrenalectomized cats treated with an aqueous extract of suprarenal cortex. Science, 71:489-490 (May 9), 1930.
The revival of comatose adrenalectomized cats with an extract of the suprarenal cortex. Science, 72:75-76 (July 18), 1930.

FOREIGN BODY (NEEDLE) IN THE ESOPHAGUS

REPORT OF A CASE*

Porter P. Vinson, M.D.
Rochester, Minnesota

If a straight slender pointed foreign body is swallowed and gains entrance into the esophagus it usually passes into the stomach. Frequently, foreign bodies of this type such as needles, straight pins and fish bones become fixed in some portion of the pharynx and are easily removed. The rarity of the presence of a foreign body of this character in the esophagus is the reason for reporting the following case:

A woman, aged seventy years, came to The Mayo Clinic for examination February 6, 1931. Two weeks previously a sticking pain had developed in her throat while she was eating an apple. The fruit had been taken from a bowl that contained needles and pins and she concluded that one of these had stuck into the apple and because of artificial dentures, had not been detected until it lodged in her throat. Examination at her home failed to reveal any evidence of foreign body in the pharynx and it was thought that her symptoms were probably nervous in origin. The sensation gradually became more pronounced, although she continued to eat solid food.

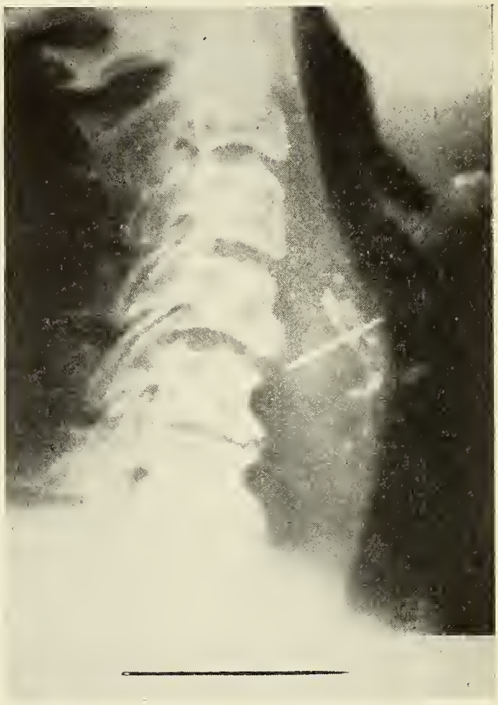


Fig. 1 *(Above).* Foreign body in the upper part of the esophagus.
Fig. 2 *(Below).* Foreign body removed from the esophagus.

General examination at the clinic did not reveal anything abnormal in the pharynx, but roentgenoscopic examination revealed a foreign body in the upper portion of the esophagus (Fig. 1). On esophagoscopic examination, there was evidence of marked inflammatory reaction just beyond the esophageal opening and in this mass of granulation tissue a needle was identified and removed (Fig. 2). Four days later, the patient was apparently perfectly well and was permitted to return home.

---

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota.

PRESIDENT'S LETTER

HOW does the medical profession actually stand in the estimate of the intelligent, unprejudiced layman who is not in immediate need of a physician's services?

It is not always easy to tell. The only voluble expressions come usually from the charlatan who would like to practise healing with no more than an almanac preparation and is balked in his noble desire. These are opinions of no more consequence to intelligent laymen than they are to physicians.

Does the medical profession still hold the exalted position in men's minds that it held in the days after Lister and Koch and Osler and the popular heroes of bacteriology had set it upon the tracks of its greatest developments? Or, has the inevitable antagonism and resistance of the profession to modern mass movements and machine methods subtly reduced it from its high place?

Some of us fear that this last may be the case, the doctor being at present unfortunately between the proverbial devil and the deep blue sea. In this position he may fight the socialization of medicine and risk appearing before the public in an unfortunate light. He may, in preference, cede everything to the bureaucratic tendencies of the times and surrender the most precious ideals and obligations of his profession, to the infinite hurt of both himself and the public.

These are dark thoughts. They occur to every physician upon whom falls the obligation of leadership in his profession.

It is therefore with a distinct sense of gratitude and pride and relief, too, that such a physician comes upon certain important paragraphs in the most comprehensive review of modern Americans and their pre-occupations ever assembled, Mark Sullivan's "Our Times."

Mark Sullivan is an intelligent layman as regards medical achievements but with the newspaper man's keen sense for evaluation and essential accomplishments. He, of all men, is in a position to know how Americans really feel and what their real interest is.

I am quoting herein the Sullivan paragraphs on medicine, lest by chance you may have missed this important lay estimate of modern medical usefulness.

"At the beginning of 1900," says Mr. Sullivan, "it had not yet been proved that yellow fever is transmitted by a mosquito, typhus by a louse, bubonic plague by a flea. Gorgas had not yet demonstrated that mosquitoes may be eliminated from any portion of the earth's surface, and man's only weapon against malaria was quinine. Neither these facts nor the fundamental fact underlying them was known; these plagues were uncontrollable except by the expedient of isolation as they had been since the beginning of history. It was not known that typhoid and cholera come from germs in unclean water and milk; these diseases were still the scourges they always had been. Insulin for diabetes, vaccination against typhoid, emetin for dysentery, adrenalin—all were still unknown. Antitoxin for diphtheria and X-ray were just coming into use. Ehrlich had not yet made those 606 experiments that resulted in the remedy for syphilis. Radium had not yet been used in the treatment of cancer. All these and many other advances in medicine, surgery and sanitation came between 1900 and 1925. They effected a six years' postponement of death and that was but one enrichment of many."

Stupendous accomplishments, these! More important by far than some other showy advances of the early part of the century, flying for instance and wireless communication. And they are only the foundation of greater accomplishments to come.

Sullivan's dramatic recital of the glories of modern medicine should hearten us all. They should strengthen us in our conviction that there is nothing more important in the world, not merely to Medicine itself, but to every living man and woman and child, than the preservation and protection of medicine against traitorous swamp lights of social organization and political meddling.

The medical profession is going through an economic crisis that is apparent now to everybody. In spite of it and of the serious dislocations of the Great War the great recital might go on. It is being expanded every day.

Sullivan recognizes it. Let not the doctor himself weaken and fall behind!

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE
Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.
Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE
A. S. HAMILTON, M.D.....Minneapolis
D. C. BALFOUR, M.D.....Rochester
J. T. CHRISTISON, M.D.....St. Paul
E. L. GARDNER, M.D.....Minneapolis
JOHN M. ARMSTRONG, M.D.....St. Paul
R. E. FARR, M.D.....Minneapolis

CARL B. DRAKE, M.D., St. Paul.....Editor
Lewis M. Daniel, M.D., Minneapolis.....Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna.....First District
F. M. Manson, M.D., Worthington.....Second District
Geo. B. Weiser, M.D., New Ulm.....Third District
H. B. Aitkens, M.D., LeSueur Center.....Fourth District
F. U. Davis, M.D., Faribault.....Fifth District
E. L. Gardner, M.D., Minneapolis.....Sixth District
Paul Kenyon, M.D., Wadena.....Seventh District
O. E. Locken, M.D., Crookston.....Eighth District
E. L. Tuohy, M.D., Duluth.....Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV May, 1931 No. 5

OUR STATE MEETING

Of the numerous medical meetings we have the opportunity of attending, the county medical societies which are the component units of the state medical association are, after all, the most important.

Just as the local county society reflects the various scientific and economic activities of the county, the state organization reflects the state activities. Our state organization gives its age as seventy-eight. What other medical society in the state can claim seniority? And the state organization is in all human probability a perpetual organization watching the rise and fall, the birth and death of other medical societies.

Just as it is the duty and privilege of each physician to join and take active part in his county society, making his influence felt in the smaller circle, it is also incumbent upon him to take part in a small or large way whenever possible in state medical activities. How can one better be active than by attending the State Meeting in Minneapolis?

The program this year promises to be a larger one than in past years with four sections instead of one or two, the time saved to be devoted to clinics, which after all are more educational than listening to addresses.

Our April issue contained the scientific program of the meeting. Additional news is contained elsewhere in this issue. Why not plan to attend?

A MOTHER INDIA OF MEDICINE

Harpers came out recently with an article* in arraignment of present-day practices in the medical profession. After reading the article, one is forced to admit, "Yes, all these things exist." Tonsils are unnecessarily removed, fees are split, surgeons operate unnecessarily for the fee, unqualified specialists do exist. But does this article correctly represent the present day status of medical practice. No!—emphatically no! The author has selected practices which are not new, which have doubtless existed for centuries, which exist today and which will be fought by the majority of the medical profession a hundred years from now just as they are being fought by the right minded members of the profession today.

The fundamental problem is one of honesty. Until medical licenses can be restricted to those who are inherently honest, these vices cannot be excluded from medical practice.

Certain constructive efforts have been made in recent years to correct the abuses maintained. Medical schools and state examining boards make some effort to weed out morally delinquent individuals with probably little success. The American College of Surgeons was founded in an effort to separate the surgical sheep from the goats. Have the goats been excluded? The task was well nigh impossible to begin with although much good has been accomplished.

---

*Bromley, Dorothy Dunbar: Specialists at Large, Harpers, Feb., 1931.

Perhaps the establishment of standards for Class A hospitals has done more for the betterment of medical practice than any other one regulation. Staff meetings, a trained pathologist and the frank discussion of operative specimens and autopsy findings, combined with a conscientious and fearless executive committee of the staff should serve as a definite check of the surgeon and internist as well. Then, too, the various societies devoted to the specialties make an effort to establish standards conducive to honest practice.

After all is said and done, the practice of medicine affords many opportunities for dishonest practices. No amount of regulations can make an honest man out of one who is inherently dishonest. We hold that the rank and file of the profession is innately honest and trying to serve the public well. Articles such as the one mentioned only serve to give a biased view of the present day situation and are destructive instead of constructive.

OUR POLICY

We hear from time to time criticisms of the editorial policy of Minnesota Medicine. A suggestion was recently made that our policy be altered to admit more discussion of the economic phases of medicine.

It might be well to define what we consider our policy. During its brief existence, the journal has been operated with the idea that the main function of a state journal and Minnesota Medicine in particular should be to make physicians better physicians. If we can share in accomplishing this objective, the existence of the journal is justified. To accomplish that end, we attempt to publish articles of scientific value. Our advertisements are selected from the same viewpoint. We believe that if physicians do their job well, they have little to fear from encroachments on the part of the cultists and irregulars.

The subject of medical economics is not new. Individual physicians have always been concerned with economic problems of one kind or another and always will. Individually and collectively we are and should be interested in the various economic trends affecting medical practice. One of the functions of a state journal is to give expression to views on the various phases of the subject. No article has ever been barred from our pages because it dealt with an economic phase of medicine. A perusal of back numbers of the journal will show that economic subjects are by no means conspicuous by their absence. Contributions on this phase of practice are welcomed.

It is our hope, however, that Minnesota Medicine will never allow medical economics to outweigh the scientific side of practice in its pages. When a physician becomes more interested in financial returns than in scientific attainment, he has lost in his professional ideals. So with a professional journal.

NORTHWEST REGIONAL MEDICAL CONFERENCE

Few of our members are acquainted with the purposes or even the existence of the Northwest Regional Medical Conference.

Realizing the desirability of joint action in policies advocated by the various state medical associations, it was thought advisable to have periodic conferences of the officers of state medical associations in the Northwest. The first conference in this part of the country was called by Dr. W. F. Braasch of Rochester in 1927, and yearly conferences have been held since that year, the last having been held at Saint Paul, February 8, 1931.

The conference was designed as an informal clearing house for new ideas and joint problems confronting the officers of the state medical associations in this region. Membership includes Montana, North and South Dakota, Wisconsin, Iowa, Nebraska and Minnesota. Representatives from these states, with the exception of Montana and Nebraska, met at the Saint Paul Hotel on February 8, for an all day session.

State lines are no barriers when it comes to medical problems, whether they take the form of quackery or changes in popular attitudes. Whatever was a potential menace in Wisconsin yesterday may be a problem in Minnesota today or in Iowa tomorrow.

This Regional Conference, is, therefore, an invaluable aid to leaders of the profession in the Northwest. It prepares them in advance for problems they will all have to meet. It enables them to assume a uniform attitude towards local and national policies. Incidentally, these conferences are important in the education of incoming presidents for their tasks. The 1931 meeting in Saint Paul set a high mark in medical statesmanship towards which its participating members can work during this year.

Next year the A. M. A. delegates from these same states will also be invited to attend the conference which will be held in the Twin Cities, this being the most central to the states involved.

For the ensuing year, Dr. Otho Fiedler, president-elect of the Wisconsin State Medical Association, was elected president; Mr. Vernon D. Blank, managing director of the Iowa State Medical Association, secretary.

E. A. M.

COMMUNICATION

BEWARE THIS SOLICITOR

St. Joseph, Mo., March 30, 1931.

To the Editor:

On February 23, this year, a solicitor victimized a number of physicians in St. Joseph. His plan was to solicit subscriptions to Harpers and other magazines and to offer sets of books as premiums. The subscription blank called for the payment of $9.70 in ninety days. He was supplied with blanks, samples of binding and everything to indicate that he was a bona fide magazine salesman.

After he had secured the signature on the subscription blank, he explained in an indifferent manner that if the subscriber cared to pay cash, or by check, there was a discount of $1.00, and the check could be made payable to "Harper Brothers Publishing Co.," the name printed on the subscription blank. The doctors "fell for it" and the next day he cashed the checks at a local bank and departed. He used the name T. T. McLean while here but has also used the name Leroy Dale.

Correspondence with the National Publishers Association, 15 West 37th St., New York, indicates that this person has been defrauding physicians in the Middle West for several months.

E. J. Goodwin, M.D.

"When a drug really possesses the virtues attributed to it, and is an effective remedy for disease, its survival into modern times is quite natural, but the fact that many quite fantastic remedies have been carried on almost to our own days, is definite proof of the slavish copying of the works of one writer to another in a continuous line that originated many centuries ago on the banks of the Nile."—From Magician and Leech. —Warren R. Dawson.

OBITUARY

BYRON W. PARROTT

1869-1931

The death of Dr. Byron W. Parrott on April 2, 1931, at his home in Long Prairie, proved a shock to the people of Long Prairie and the vicinity where he had practiced his profession since 1899. A brief illness from pneumonia preceded his demise.

Dr. Parrott was educated in the public schools of Faribault, Minnesota, and received his medical degree at the University of Minnesota in 1897, taking his internship at the City and County Hospital in St. Paul.

During the World War Dr. Parrott served as Captain in the Medical Corps of the United States Army and resumed practice following the armistice.

He was of a kindly and sympathetic nature and these attributes held the friendship of all who knew him.

Dr. Parrott is survived by his widow, and one son, Dr. Earl C. Parrott of South Milwaukee, Wisconsin.

BOVININE AND NEOBOVININE NOT ACCEPTABLE FOR N.N.R.

The Council on Pharmacy and Chemistry reports that Bovinine and Neobovinine are marketed by the Bovinine Company of New York and Chicago. In 1909 the Council reported that while Bovinine was advertised as a "condensed beef juice prepared by a cold process," it was not meat juice but a mixture of alcohol, glycerin, added sodium chloride, and apparently some form of defibrinated blood and that the product was marketed with unwarranted claims. In 1914 the Council reported that the unwarranted claims were, for the greater part, still made, and also that the conclusions of the first report were fully warranted by the experimental evidence. The Council has not given consideration to the product since the report in 1914 was issued. Attention having again been called to Bovinine through the advertising for a similar one, "Neobovinine," which is marketed with it, a referee of the Council reported that for Bovinine the situation remained about the same as when the product was last considered. Neobovinine 20 is stated to be "essentially BOVININE *(Plain)* in which is incorporated the active principle of fresh whole liver." Certainly the combination of Bovinine with a liver extract of undeclared character must be held an unscientific mixture. The case histories are entirely unsatisfactory and report conditions in which it is known that there could not possibly be the results reported. The cases of pernicious anemia are not reported with sufficient data on which to base an opinion. The Council reaffirmed the rejection of Bovinine and declared Neobovinine unacceptable because the information in regard to its composition is inadequate, because the therapeutic claims advanced for it are unwarranted, and because the combination of "Bovinine" with a liver extract of undeclared character is unscientific. (Jour. A. M. A., March 14, 1931, p. 860.)

« A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

LET THE COUNTY SOCIETY DO IT!

It is one thing, as every busy physician must feel, to recognize the obvious threat of socialization of medicine in America. It is another to know just what to do about it.

This feeling of helplessness and bewilderment is not very successfully dispelled by much of the discussion on the subject, even by representatives of organized medicine. Mostly these discussions deal at length with unmistakable signs of the times. But by way of conclusion there is usually only a vague, sweeping exhortation to the physician to hurry up and do something.

In this respect, an article by Dr. G. A. Harper, State Health Officer of Wisconsin, published recently in the United States Daily in Washington, D. C., is remarkable. His advice to the profession, quoted below, is definite and practical. Dr. Harper says the county society can carry on the battle in its routine dealings with the rest of the world. In the handling of small, close-at-hand problems involving the relations of the county society to the State Health Department, the social service organizations, the public press, lies the solution of all the large problems of medicine in America. Here and not in some showy general movement is where he would start the intrenchment and defense for the dignified, independent, competitive practice of medicine against well meant but ill-advised social reform.

Dr. Harper says:

"One of the first steps towards the prevention of general socialized medicine would be for each county medical society to select a committee to study the problem in all its aspects—the duties of this committee should be to work out a procedure as to public education, to make contact with public officials and various welfare agencies, to interest itself practically in community problems, particularly relating to health and general welfare. Such committees should bring the entire medical profession in as part of the body politic. They should go out of their way to help solve many of the minor problems that are agitating local governing officials.

"By finding a proper solution to minor problems undoubtedly the larger and more vital problems—so far as the profession is concerned—would be held in abeyance or entirely eliminated.

"The first application of such a procedure should be simple and fundamental and concern itself, probably, with solving the medical care problem for the indigent. Social Agencies should be given aid and assistance. The objectives of the Health Department should be better understood and a plan worked out for closer coöperation. Known scientific procedure should be handled by the County Medical Society but mainly as a community problem which cannot be left wholly, as things are now, to the individual family and the family physician.

"For a century vaccination against small-pox has been known but in its general application little advance has been made. Toxin-antitoxin can be similarly classified. The monetary consideration in dealing with this problem is minor no matter how it is handled when compared to its possible effect in abating the tendency to socialization of medicine. The principle should assuredly be established that the medical profession is to be paid for services rendered. Whatever the sum may be is secondary to the establishment of the fundamental principle in the minds of the governing body and the citizenship as a whole that the medical profession should not be pauperized.

"In view of the fact that it is estimated that 70 per cent of our citizenship does not get the proper medical care at the time it is needed, we must and do admit that something is wrong with the present system. It would not appear, however, that general socialization of medicine is the remedy. Proper organization of the system of medicine that now exists, proper education of the public to the value of medical care at the time it is needed, whether it is preventive or curative medicine, are the logical solutions. Organized medicine must assume the responsibility in these things if it is to maintain its independence. I believe the county units, backed by the State and National Societies, hold the key to the situation."

OF GENERAL INTEREST

Dr. F. R. Huxley is now spending a vacation in Florida.

Dr. Brand O. Leopard has moved from St. Cloud, Minnesota, to Evanston, Illinois—2602 Eastwood Avenue, Apt. F-1.

Dr. Lawrence R. Boies has returned to Minneapolis to limit his practice to Oto-laryngology, after an absence of two years spent in special study at the Harvard Medical School, and as a House Officer at the Massachusetts Eye and Ear Infirmary. He has offices at 1833 Medical Arts Building.

Dr. Leo M. Crafts, of Minneapolis, has been named as a delegate to the International Neurological Congress which meets at Berne, Switzerland, the last of August and the first week of September, 1931. His present plans meditate spending the earlier part of the summer in travel in the British Islands and on the Continent, including comparative clinical observations at Edinburgh, London, Paris and Rome according to his usual custom on previous trips, arriving in Switzerland at the end of the season in time for the sessions of the Congress.

Dr. Crafts is the author of the first comprehensive textbook ever published on "Epidemic Encephalitis," designated by the American Medical Editors and Authors Association as standard text on this subject, and has recently been awarded their diploma certificate of membership "in recognition of his contributions to medical knowledge." The Research Council of the National Academy of Science also credits him with four separate contributions to scientific knowledge through original research in "Family Periodic Paralysis," "The Early Recognition of Multiple Sclerosis," "An Original Test for the Pathologic Great Toe Sign," and "The Iris Sign in Locomotor Ataxia."

TUBERCULOSIS PREVENTION CAMPAIGN

Dr. F. E. Harrington, Minneapolis commissioner of health, will direct the fourth annual tuberculosis prevention campaign which will be conducted in Minneapolis April 19 to May 1. The campaign, sponsored here by the Hennepin County Tuberculosis Association, is part of a nationwide educational program carried out through 1,400 tuberculosis associations, to focus the attention of the public on the importance of early diagnosis. "Tuberculosis—The Foe of Youth," is the slogan of the campaign this year which will place special emphasis on the tuberculosis of early maturity.

CANCER CLINICS

Dr. Joseph Colt Bloodgood of Johns Hopkins University, Baltimore, will conduct a morning and afternoon clinic, showing bone tumors and other new growths, at a meeting of the Radiological Section of the Wisconsin State Medical Society, Schroeder Hotel, Milwaukee, May 27, 28, and 29.

Presentation of cases will be by lantern slides and include the following material: (1) Short clinical history (diagnosis omitted), (2) Photographs, (3) Radiographs, (4) Microphotographs, (5) Serial radiographs of cases treated by radiation.

Members of the Minnesota State Medical Society are cordially invited to attend this meeting and show their interesting bone tumor cases at the clinics. Send us a list of the cases you desire to show.

Program of meeting, hotel reservation, and other information on request.

Further information may be obtained from Frank W. Mackoy, M.D., Secretary, Sacred Heart Sanitarium, Milwaukee, Wisc.

POST-GRADUATE COURSES, DELIVERED IN THE ENGLISH LANGUAGE IN THE LEADING HOSPITALS OF PARIS (FRANCE)

The Faculty of Medicine of Paris (The Medical School of the University) announces that, during June and July, 1931, a comprehensive series of post-graduate courses will be presented. The enterprise is conducted under the auspices of the Association for the Development of Medical Relations (the "A. D. R. M."), a commission sponsored by the French Government.

The work will be presented in the English language. Clinics, lectures and demonstrations will be conducted in the great hospitals of Paris, on a wide variety of topics, by the most eminent French clinicians. A nominal fee will be charged for each course. Upon the completion of each course, the student who qualifies will receive a certificate covering the work, signed by the professor in charge.

Detailed information may be secured by addressing direct, Professeur E. Hartmann, President, "A. D. R. M.," Faculty of Medicine of Paris, 12, Rue de L'Ecole de Medicine, Paris (6e) or, in the United States, Doctor Frank Smithies, 920 North Michigan Avenue, Chicago, Illinois.

MINNESOTA ALUMNI LECTURE COURSE

The Minnesota Medical Alumni Association organized, and is now giving, a course of lectures to the Senior medical students under the direction of Dr. Sam Solhaug. These lectures are on topics not usually included in the regular school curriculum. They are being given weekly on Friday afternoons at 5:00 o'clock in the Eustis Amphitheatre throughout this spring quarter. The attendance has been very gratifying and if the project meets with general approval it is planned to have the series repeated in the spring and fall hereafter, in order that all Seniors may have the advantage of hearing the speakers.

The course as arranged this spring is as follows: Dr. A. S. Hamilton has already spoken on "Medical Ethics," and Dr. John Hynes on "Art and Experience in Medicine." Dr. P. D. Ward, Superintendent of Miller Hospital, St. Paul, will speak on, "The Relation of

Hospital and Staff Physicians." Dr. W. A. Coventry of Duluth will discuss, "Medical Organizations." "Business Methods in Medicine" will be discussed by Mr. A. G. Stasel, and Dr. N. O. Pearce will present the topic, "Social Service in Relation to Medicine." "Public Health and Civic Aspects of Medicine" will be the subject of a talk by Dr. O. E. Locken of Crookston and Mr. E. J. McGough, Attorney, will talk on "Compensation Insurance." Other subjects may be included in subsequent courses.

NEW AND NON-OFFICIAL REMEDIES

The Council on Pharmacy and Chemistry has accepted the following:

Ciba Company, Inc.
- Nupercaine-Ciba
  - Ampules Buffered Solution of Nupercaine-Ciba, 2 c.c., 1:200
  - Ampules Solution of Nupercaine-Ciba, 5 c.c., 1:1,000
  - Solution of Nupercaine-Ciba, 2%
  - Tablets Nupercaine-Ciba, 50 mg.

Lederle Laboratories, Inc.
- Refined and Concentrated Antipneumococci Serum, Type I-Lederle

Mead Johnson & Co.
- Mead's Powdered Brewer's Yeast

Schieffelin & Co.
- Schieffelin Psyllium Seed

Swan-Myers Company
- Mixed Grass Pollen Extract-Swan-Myers
- Russian Thistle Pollen Extract-Swan-Myers

TRUTH ABOUT MEDICINES

Antipneumococcic Serum, Type 1.—An antipneumococcus serum (New and Non-official Remedies, 1930, p. 351), marketed in packages of one 50 c.c., double-ended vial with apparatus for intravenous injection. The National Drug Co., Philadelphia.

Erysipelas Antistreptococcus Serum.—A specific serum containing the antibodies and antibacterial properties of *Streptococcus erysipelatis.* For therapeutic use against erysipelas it may be of value when administered in adequate doses in the early stages of the disease. Though there is no evidence for the value of nonspecific antistreptococcus serums, there appears to be some evidence for the value of a serum representing the antigenic and antibacterial properties of *Streptococcus erysipelatis.*

Erysipelas Antistreptococcic Serum-Lilly (Concentrated Globulin).—The serum is obtained from horses immunized with strains of hemolytic streptococci obtained from human cases of erysipelas. It is marketed in packages of one syringe containing an average initial theraputic dose. Eli Lilly & Co., Indianapolis.

Richards Psyllium Seed.—A brand of psyllium seed-N. N. R. (New and Non-official Remedies, 1930, p. 311). Richards Pharmacal Co., Inc., New York.

Ointment Scarlet Red Biebrich 8 Per cent.—An ointment composed of scarlet R medicinal Biebrich-N. N. R. (New and Non-official Remedies, 1930, p. 148) 8 per cent in a base consisting of stearin, wool fat and petrolatum. The National Drug Co., Philadelphia.

Typhoid-Paratyphoid A Vaccine.—This product (New and Non-official Remedies, 1930, p. 373) is also marketed in packages of three 1 c.c. vials. The National Drug Co., Philadelphia. (Jour. A. M. A., December 6, 1930, p. 1745.)

Antirabic Vaccine, Semple Method.—An antirabic vaccine (New and Non-official Remedies, 1930, p. 352) prepared according to the general method of David Semple (phenol killed). It is marketed in packages of fourteen vials, each containing 2 c.c.; in packages of fourteen vials, each containing 2 c.c. and a syringe; in packages of fourteen syringes, each containing 2 c.c. Medical Arts Laboratory, Inc., Oklahoma City, Oklahoma.

Diphtheria Toxoid-Squibb.—This product (New and Non-official Remedies, 1930, p. 364) is also marketed in packages of twenty 1 c.c. ampules of diphtheria toxoid and two 1 c.c. ampules of diluted diphtheria toxoid for the reaction test. E. R. Squibb & Sons, New York.

Normal Horse Serum.—This product (New and Non-official Remedies, 1930, p. 340) is also marketed in packages of one 50 c.c. vial. E. R. Squibb & Sons, New York.

Sodium Gold Thiosulphate—Sodii et Aurii Thiosulphas—Gold Sodium Thiosulphate.—The complex salt formed from one molecule of gold thiosulphate and three molecules of sodium thiosulphate, containing approximately 37.4 per cent of gold. The use of sodium and gold thiosulphate in the treatment of lupus erythematosus is considered a distinct advance in the therapy of this condition. The beneficial and often curative action of the drug in a good percentage of cases seems to warrant giving it a definite place in the treatment of a disease for which at present there is no specific remedy. The drug must be used with extreme caution. Dosages at first advocated have been found too great, resulting frequently in severe and even fatal reactions. Even with smaller doses, accidents have occurred.

Gold Sodium Thiosulphate-Abbott.—A brand of sodium gold thiosulphate-N. N. R. It is supplied in ampules containing respectively 0.05 Gm., 0.1 Gm., 0.25 Gm., and 0.5 Gm. Abbott Laboratories, North Chicago, Ill.

Diphtheria Toxin-Antitoxin Mixture (Diphtheria Prophylactic).—This product (New and Non-official Remedies, 1930, p. 356) is also marketed in packages of one hundred and fifty 1 c.c. vials, fifty immunizations. The National Drug Co., Philadelphia.

Diphtheria Toxoid.—This product (Jour. A. M. A., November 15, 1930, p. 1505) is also marketed in packages of ten immunization treatments containing two 1 c.c. vials of diluted diphtheria toxoid for the reaction test and twenty 1 c.c. vials of diphtheria toxoid for treatment; in packages of fifteen immunization treatments containing one 1 c.c. vial of diluted diphtheria toxoid for the reaction test and one 30 c.c. vial of diphtheria toxoid for treatment. Lederle Laboratories, Inc., Pearl River, N. Y.

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—A boy of three was seen three months ago with an enlarged right tonsil. The left tonsil was twice the size of the right and there was moderate enlargement of the left cervical glands. Tonsillectomy was done and the child not seen again until now. Present condition shows extreme enlargement of all left cervical glands, all separate, the two largest fluctuating. Contents are grayish fluid containing lymphocytes. There is also enlargement of right and left axillary and right and left groin glands. The spleen is not palpable, and there is no enlargement of the right cervicals. Blood erythrocytes 4,200,000; leukocytes 11,200; 65 per cent lymphocytes; hemoglobin 80 per cent. Biopsy report on gland removed does not show malignancy. Tuberculin test was negative. There was also some arthritis and fever. What is your diagnosis, if above is sufficient to make one?

   Answer.—Leukemia should be given first consideration. A careful study of the stained smear might reveal immaturity in the lymphocytes. We note that the count is not greatly elevated but that 65 per cent lymphocytes are present. The reported hemoglobin of 80 per cent is against the diagnosis of leukemia and favors some form of infection with a reaction in the blood especially along the lymphocyte line. This is also suggested by the statement that some arthritis and fever are present. It is a matter of common clinical experience that enlargement of the tonsils may be the first obvious signs of leukemia. You did not state the condition of the mouth. Frequently, infections in children are associated with a form of stomatitis (Vincent's organisms). The blood should be examined at frequent intervals, and if signs of immaturity are constant, a diagnosis of leukemia is justified. Otherwise, some type of general infection with probable portal in the throat is the condition which seems most obvious.

2. *Question.*—Patient, age 49, married, one child living and well. For the past eleven years, the left breast has discharged a clear, serous fluid on pressure. The patient states that if she sleeps on the left side there will be a discharge from the breast. The past year she has noticed a little blood in the discharge and a small lump that comes and goes. I could not find a lump on examination (breast is soft). She states that sometimes it is a little sore to the touch around the nipple. She fears cancer. Would cancer be likely with a condition of such long standing?

   Answer.—The commonest cause of discharge from the nipple, whether clear or bloody, is cystic disease. Very often the bloody discharge is due to a papilloma in the duct. The fact that the mass comes and goes would suggest that a papilloma is present (retention). If a definite mass can be palpated, it is necessary to remove the same for microscopic study. If you cannot palpate a definite mass and your patient continues to worry about cancer, it would be advisable to have her come in when she feels a lump and remove the same for study. Cancer may develop in any type of breast, normal or otherwise. The most important thing to do is to examine all lumps to find out whether they are malignant or not.

3. *Question.*—A single woman, age 22, had an appendectomy done under local anesthesia. The appendix showed moderate inflammation. Convalescence was uneventful, until the seventh day, when she insisted that she was well enough to leave the hospital. Permission was denied, but she was allowed to be up and about on the eighth and ninth days for a little while and experienced no untoward symptoms. The tenth postoperative day, she felt very good and was given permission to go home. She was assisted in her dressing by the nurses, and felt so well that she thought she could carry a small suit case. She was assisted in walking to an automobile, about seventy-five feet away. Just as she was being helped on to the running board, she slumped into the attendant's arms so suddenly that she was almost allowed to fall to the ground. Her face was cyanotic, and she developed involuntary urination and defecation. She was completely unconscious. They carried her back to the hospital, where she was found to be pulseless, breathing very shallowly and rather slowly. Artificial respiration was done for some time and stimulants were injected. We could not get the slightest sign of pulse or hear anything over the cardiac region at this time. There was no history of any previous illness so far as I know with the exception of the attack of appendicitis which necessitated the operation. What are the possible causes of death?

   Answer.—In the absence of an autopsy, no definite opinion can ever be rendered in a case like this. Many of them are classified as heart failure. Acute cardiac dilation is probably unknown. Experiments conducted on animals indicate that the pericardial sac around a normal heart will not allow this condition to take place. Hearts which are chronically dilated as the result of hypertrophy may suddenly fail, but this is not acute dilation. Other causes are pulmonary embolism, cerebral embolism and hemorrhage. Most of the cases of pulmonary embolism develop in individuals who have silent thromboses in the pelvis or femoral veins. The condition is probably brought about through stasis following operative procedures, and may occur after operations on any part of the body. The clot detaches when the patient attempts to move about and sudden death is due to plugging both the branches of the pulmonary artery. The absence of clinical signs of thrombophlebitis would not be against this possibility in your case. The head should always be examined in sudden death as many unsuspected conditions may be found in this region, *e.g.,* in a recent postoperative death a large silent brain tumor was discovered. Older clinicians always taught that an examination of the heart, lungs, and brain is indicated in any sudden death. Toxic changes in the myocardium may cause sudden failure, but this type of cardiac failure is not common except in severe forms of this condition, *e.g.,* diphtheria. In a considerable

(Continued on Page 462)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: Dr. William A. O'Brien, M.D., Associated Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of May will be as follows:

May 6—The Enuresis Problem.
May 13—Spring Tonics.
May 20—Botulism.
May 27—Bone Tumors.

MINNESOTA STATE MEDICAL ASSOCIATION

An important scientific program, amounting, in fact, to a two-day medical short course, will feature the 78th Annual Meeting of the Minnesota State Medical Association scheduled to open Tuesday morning, May 5th, at the Nicollet Hotel in Minneapolis.

This program is to be divided into three parts. The first, to be held in the Nicollet Hotel Ball Room, is a symposium on surgery and obstetrics.

The second, to be held at the University of Minnesota Hospitals, is to take the form of continuous all afternoon clinics in four amphitheaters of the institutions. There will be thirty-two of these clinics in all. One group to be held in amphitheater A will be varied; Group B will be chiefly medical; Group C chiefly pediatric and Group D chiefly surgical. Eight clinics will be held consecutively in each group and no two will be alike. They will have as leaders members of the University of Minnesota Medical School teaching staff and other Minnesota leaders.

A symposium on diagnosis at the Nicollet Wednesday morning constitutes the third important section of the program. The fourth will be a symposium on therapy Wednesday afternoon.

Scientific and commercial exhibits, all intimately related to the program, are to distinguish this meeting. The first scientific talking pictures ever secured for one of these meetings are to be a continuous feature of the exhibit room, which constitutes the entire mezzanine floor of the Hotel. A prize for the best individual exhibit will be presented by the Southern Minnesota Medical Society, following the precedent set by the Society at Duluth last year.

The annual banquet, scheduled for Tuesday at 7 P. M., is the major social event of the two-day session with alumni and fraternity luncheons scheduled for noon each day and a golf tournament at the Midland Country Club Monday afternoon, May 4th, preceding the meeting.

Other pre-program events are the council meeting scheduled for Monday afternoon at 3 P. M. and the House of Delegates meeting in the Nicollet Hotel ball room Monday night at 7:45 P. M.

The Women's Auxiliary of the Association will hold its Annual Meeting as usual in conjunction with the Association meeting.

Any alumni or fraternity groups who wish to hold reunions during the two days of the Minnesota State Medical Association annual meeting, are requested to call Dr. C. J. Arenberg, 1013 Medical Arts Building, Minneapolis, Geneva 6768, for accommodations and dates.

The University of Minnesota Alumni Association and Phi Beta Pi fraternity luncheon are scheduled for Wednesday noon. Accommodations are still available for others during or preceding the meeting.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The Northern Minnesota Medical Association meeting will be held in Hibbing, Minnesota, Friday and Saturday, September 18 and 19, 1931.

The Program Committee consists of: Dr. W. L. Burnap, Fergus Falls; Dr. Cyril Smith, Duluth; and Dr. O. O. Larson, Detroit Lakes, who is also Secretary.

This Committee will be glad to hear from anyone who wishes to give a paper.

B. S. Adams, M.D.

RICE COUNTY MEDICAL SOCIETY

A meeting of the Rice County Medical Society was held April 3 in the Faribault Clinic rooms. Dr. F. A. Engstrom, Wanamingo, Minn., was elected to membership in this society and also Dr. Laura A. Lane, of Northfield.

Dr. H. E. Michelson, Minneapolis, the principal speaker of the evening, addressed the society on "Dermatology," and gave an excellent presentation worthy of commendation.

C. J. Plonske, *Secretary.*

SCOTT-CARVER COUNTY MEDICAL SOCIETY

A meeting of the Scott-Carver County Medical Society was held at the Broz Hotel of New Prague, March 10, 1931. Dr. Martin H. Nordland of Minneapolis, gave a talk on the "Thyroid Gland" and with lantern slides and motion pictures illustrated his method of pre-operative ligation of the inferior thyroid artery. Through the courtesy of the Petrolagar Laboratories, Mr. F. A. Augustine of Minneapolis presented motion pictures on the following subjects:

"The Anatomy of the Abdominal Wall"
"Hydrocele"
"Appendectomy"
"Colles Fracture"

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. S. S. Hesselgrave, St. Paul
Chairman Press and Publicity—Mrs. E. A. Meyerding, St. Paul
Editor—Mrs. A. A. Passer, Olivia

Through the courtesy of the Minnesota Federation of Women's Clubs, the Women's Auxiliary to the state medical society broadcast a Health Program over WCCO, Monday afternoon, March 16. Mrs. S. S. Hesselgrave, state president, was one of the speakers.

WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

Ninth Annual Meeting
Philadelphia, June 8-12, 1931.
Headquarters, Bellevue-Stratford Roof Garden
Registration Hours, daily 9 A. M. to 5 P. M.

All women attending the convention, whether Auxiliary members or not, are invited to participate in this entire program.

All tickets and invitations must be *procured in advance* in the Bellevue Roof Garden. Only programs will be obtainable elsewhere.

The Woman's Auxiliary to the American Medical Association has been placed in charge of all entertainment of women visitors, and began its labors on June 27, 1930, by engaging the whole Roof Garden of the Bellevue-Stratford Hotel for the period of the convention. All women's activities will center in this hotel—registration, meetings, luncheons and supper dance, and all excursions will start from the Broad Street entrance. Invitations and tickets must all be procured in the Roof Garden *in advance,* as nothing but programs will be obtainable elsewhere. Members of the A. M. A. are invited to join all excursions, and should register for them in advance in the Roof Garden. Rooms for State Headquarters have also been reserved in the hotel, and sponsors will be appointed to look after all women registered from their own states. The list of sponsors will be printed in the program. We take this opportunity to thank the management of the Bellevue for their generosity in placing all these facilities at our disposal free of charge. The chairman of the Women's Hotel Committee is Mrs. Frederick S. Baldi, 2117 Porter Street, Philadelphia, who will be glad to make any desired reservations.

The convention will open with a subscription buffet luncheon in honor of all National Auxiliary Presidents from Mrs. Red to Mrs. McGlothlan, immediately followed by three round tables of 35 minutes each, with 10 minute intermissions, each under expert leadership. The subjects will be:

1. Programs for County Auxiliary Meetings.
2. The Technic and Value of a Committee on Public Relations.
3. History and Archives.

These informal gatherings will be a sort of preliminary canter, designed to bring together those interested in special phases of Auxiliary work and give them opportunity to discuss the subject thoroughly during the following days. The National Board dinner and preconvention meeting are scheduled for Monday evening.

A new and, we hope, helpful feature will be a Question and Suggestion Box to which we beg all with good ideas to contribute. This seems the most practical way of finding out what our members want continued, what discarded, and what plans are indicated for the future.

The regular business sessions will be held on Tuesday and Wednesday mornings. National Chairmen will be allowed 10 minutes for their reports, State Presidents 3 minutes. Reports to be printed may be as long as desired (in reason), but let no one reporting on the floor imagine these limits an idle jest. Nor will the hours announced on the program be found to mean "about." Have your watches cleaned and regulated, and practice your wrist drill before leaving home. You will need it.

Thursday morning, too, will be a busy one, the post-convention Board meeting, a special meeting for State and County treasurers desiring further elucidation of the treasurers' receipt blanks, and at 10:30 an informal round table presided over by the new president, the subject, "What Have I Gotten Out of the Convention?" At this meeting Mrs. McGlothlan will announce her committee chairmen and outline her plans for the coming year, and the subjects in the Question Box will be discussed, a sort of stock taking, closing the year's business and opening the new books.

Philadelphia as a historical and cultural center is the keynote of the entertainment planned for our guests. Except Monday, all afternoons and evenings will be devoted to pleasure, and a variety of excursions is offered to suit all tastes, all physiques, and all weathers. They include bus trips to Valley Forge and to Longwood, the beautiful estate of Mr. and Mrs. Pierre S. duPont, a boat trip on the Delaware, and visits to the Fairmount and Rodin Museums and to the Historical Society of Pennsylvania. The Museum authorities are delighted to provide docent service for those desirous of more than a passing glance at their treasurers, and the Historical Society will arrange a special exhibition for the week, including portraits, prints, and engravings, documents, silver, etc., from its unsurpassed collection of Americana. There will also be a brief historical address by Dr. Charles W. Burr of Philadelphia.

Wednesday will be a field day—the big Auxiliary luncheon—with guests and speakers from the A. M. A. and a beautiful musical program, the gift of the Delaware Auxiliary. In the afternoon the Philadelphia County Medical Society invites the women to be their guests on a bus trip through historic Philadelphia (a 10 minute stop at Independence Hall), Fairmount Park and Germantown to "Stenton," where the New Jersey Auxiliary invites us all to tea. "Stenton," the home of James Logan, Penn's friend, Secretary of the Colony, still stands just as it was built in 1728, the furniture of the period, the garden laid out as described by contemporaries. On Wednesday evening the Pennsylvania Auxiliary invites all visiting ladies to a reception in the superb Chinese Rotunda of the University Museum, a setting probably unsurpassed in any museum anywhere.

This meeting of the A. M. A. in Philadelphia is the first in 30 years, and the County Medical Society, desiring to mark so auspicious an occasion, and also in appreciation of the work of the Auxiliary, invites all members of the A. M. A. and the visiting ladies to be their guests at a supper dance in the Ball Room of the Bellevue, following the big meeting of the A. M. A. on Tuesday evening at the Academy of Music. The President's ball at the Benjamin Franklin Hotel on Thursday evening, to which all are invited, will close the formal festivities.

To those still able to rise from their beds on Friday morning there are offered a tour of Wanamaker's with luncheon in the Crystal Tea Room, or an all-day bus trip to Atlantic City, where the New Jersey Auxiliary will meet them for luncheon at the Claridge. This program includes also a visit to the new Convention Hall, an hour in a chair on the Boardwalk and plenty of time for window shopping or a swim.

And finally, every day and all day there will be a booth in the Roof Garden inscribed "As You Like It—Anywhere," where those wishing to golf, shop, go to Garden Days, or carry out any other pet project not elsewhere provided for may find information and assistance in making a profitable use of their opportunity.

Will you not reward our efforts by the largest and most enthusiastic women's attendance in the history of the American Medical Association?

Corinne Keen Freeman,
General Chairman.
(Mrs. Walter Jackson Freeman).

HENNEPIN COUNTY AUXILIARY

The regular meeting of the Auxiliary to the Hennepin County Medical Society was held March 18. Mrs. Martin Nordland, the President, was in the chair. A delightful group of piano selections was given by Miss Bernardine Cornea of the University of Minnesota. Dr. Meyerding gave an interesting talk on "The Relation of the Minnesota Public Health Association and the State Medical Association."

The annual Easter card party was held in the Assembly room of the Hennepin County Society on Easter Monday afternoon. Tickets for about 125 tables were sold. We are glad to say that it was a social and financial success.

Under the efficient leadership of Mrs. A. E. Hedback as chairman, with Mrs. J. M. Hayes and Mrs. C. W. Rucker and their committees, the Auxiliary has again been provided with funds to carry the philanthropic work of the group for the year. This year our particular venture is the furnishing of a room in the new home for patients with arrested tuberculosis from Glen Lake Sanatorium, which has come to the city through the generosity of Mrs. W. O. Winston.

The Auxiliary has ventured into a new field of activity, and has revived the noonday luncheon for the Medical Society, which was practically dead of inanition. The evident success of the experiment brought an appropriation from the Medical Society for needed equipment, but dishes and kitchen utensils cannot make a successful lunch-room, and the gratifying results are due to the devoted effort and interest of this group of women who have undertaken this work. It has become so popular that several committees of the Medical Society have asked that luncheons be served for their meetings.

The following committees have been appointed for the entertainment of the wives of the doctors at the State Medical meeting, May 5 and 6:

Registration—Mmes. H. J. Tunstead, J. D. Lyons, E. S. Strout, G. D. Nordin, W. B. Roberts, G. D. Eitel, O. S. Wyatt, and F. S. McKinney.

Transportation—Mmes. R. M. Rosenwald, Emil Robitshek, and E. J. Huenekins.

Program—Mrs. James Blake and her committee.

Printing and Publicity will be handled by Mrs. T. F. Quinby.

All registrations for visiting women will be taken care of at the Nicollet Hotel, beginning Monday afternoon, May 4. On Tuesday morning, May 5, at 10:00 o'clock, the annual Board meeting of the State Apxiliary will be held in parlors O, P and Q and a Dutch Treat luncheon at the Nicollet Hotel in the main dining room, to which all visiting women are invited. That same afternoon, Mrs. J. A. Watson and Mrs. J. S. Reynolds will be hostesses in the lounge of the Medical Society rooms to meet any visiting women who may wish to drop in for a game of bridge or an informal visit.

The banquet Tuesday evening, May 5, is open to all visiting doctors and their families. This will be held at 7:00 p. m. in the Ball Room of the Nicollet Hotel.

The annual business meeting and election of officers will be held Wednesday, May 6, at 10:30 a. m. in the assembly room of the Hennepin County Medical Society. This will be followed by a luncheon at the Woman's Club on Oak Grove Street, at 1:30. Transportation will be provided for all visiting women from the Medical Arts Building to the Club. The plans for the entertainment to follow the luncheon include a talk by Mr. H. A. Bellows, Vice President of the Columbia Broadcasting System, and music by the Thursday Musicale Ensemble which includes a number of our Minneapolis doctors' wives.

Mrs. S. H. Baxter.

NICOLLET-LE SUEUR AUXILIARY

An Auxiliary of the Nicollet-Le Sueur County Medical Society was organized April 8 at a joint meeting held at the Merchants Hotel, Jordan, in conjunction with the women of the Scott-Carver Society. Officers elected were: Mrs. Joseph O. McKeon, Montgomery, president; Mrs. W. W. Covell, St. Peter, vice president, and Mrs. Melvin Lenander, St. Peter, secretary-treasurer.

RICE COUNTY AUXILIARY

The March meeting of the Rice County Auxiliary was held at the home of Mrs. J. W. Murdoch, of Faribault, with Mrs. Haynes as assisting hostess. Mrs. A. M. Hanson, Faribault, president, presided at the business session, which was followed by a most amusing paper on "Methods of Quacks," read by Mrs. Haynes. A layette was made and donated to the Faribault and Northfield hospitals. Eight doctors' wives from Owatonna were guests at the meeting.

ST. LOUIS COUNTY AUXILIARY

The St. Louis County Auxiliary has been continuing its policy of philanthropic work throughout the year. The members are sewing on Red Cross articles at the regular meetings to help county Red Cross work. At the last meeting it was voted to send a working girl to the summer session of the University at Madison, Wisconsin. This University offers a short course each summer for working girls.

SCOTT-CARVER AUXILIARY

At a luncheon meeting held at Chaska, April 8, a Women's Auxiliary to the Scott-Carver Medical Society was organized. Mrs. S. S. Hesselgrave of St. Paul and Mrs. James Blake of Hopkins were guest speakers. The following officers were elected: President, Mrs. Bernard H. Simons, Chaska; vice president, Mrs. H. P. Fischer, Shakopee; secretary-treasurer, Mrs. H. E. Wunder, Shakopee.

STEARNS-BENTON AUXILIARY

On Tuesday, April 7, the Stearns-Benton Auxiliary met at the home of Mrs. J. P. McDowell of St. Cloud. The president, Mrs. Werner Hemstedt, was in the chair. The business session was followed by games of bridge. Since the first of the year several members have spent Friday afternoons sewing and mending at the St. Cloud Hospital.

WASHINGTON COUNTY AUXILIARY

The Women's Auxiliary to the Washington County Medical Society was entertained at a one o'clock luncheon at the University Hospital, Minneapolis, Tuesday, April 7. Other guests at the luncheon were the wives of the faculty members, who act as an auxiliary to the University hospital: Dean Lyon of the Medical School and Mrs. Lyon; Dr. O'Brien, and the head nurses of the hospital. Superintendent Paul Fesler, Dean Lyon and Dr. O'Brien gave short talks after the luncheon. The guests were then conducted on a tour through the hospital, and heard talks by Dr. Stenstrom, in charge of the radium department, and Dr. W. T. Peyton on cancer. The use of the respirator was demonstrated by Miss Clark. The Washington County Auxiliary will serve refreshments at Lakeview Memorial Hospital, Stillwater, May 10, to the visitors assisting the hospital superintendent. Mrs. J. W. Stuhr of Stillwater is president of the Auxiliary.

WEST CENTRAL AUXILIARY

The annual business meeting of the West Central Auxiliary was held at Wheaton, April 8. The following officers were elected: President, Mrs. Charles Bolsta, Ortonville; vice president, Mrs. A. L. Fitzgerald, Morris; secretary-treasurer, Mrs. Bert Karn, Ortonville. Mrs. C. F. Ewing of Wheaton, retiring president, presided at the session.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of March 11, 1931

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 11, 1931. Dinner was served at 7 p. m. and the meeting was called to order at 8 p. m. by the President, Dr. J. S. Gilfillan. There were fifty-one members present.

Minutes of the February meeting were read and approved.

The scientific program of the evening was as follows:

Dr. A. R. Colvin (St. Paul) reported two cases and showed specimens.

Case 1.—Gallbladder in female pelvis. The patient, a woman aged 72, was first seen December, 1929, complaining of a mass in the lower abdomen; it was painless, not tender, and quite movable. She was concerned because of the tumor but did not want to consider surgery because it did not cause any pain. She was of the rather feeble type for 72, and surgery was not urged at that time. Nevertheless, a diagnosis of the nature of the mass was not made.

In April, 1930, she says she began to have some "heavy discomfort" in the abdomen, but no pain. In June, 1930, she says she began to have attacks of pain which she attributed to food, and she said that recently the tumor would disappear at times, and at these times she felt better.

When seen in early November, 1930, she had an attack of abdominal pain followed by jaundice. The pain continued intermittently, and the jaundice became deeper. The tumor had disappeared but she felt some pressure in the pelvis.

Examination revealed a fluctuating mass filling the pelvis. She had quite a kyphotic spine and a consequent approximation of the ribs to the iliac crest. There was no abdominal tenderness. The combination of jaundice and pain suggested common duct stone and the opinion was hesitatingly expressed that the mass in the pelvis could be an enlarged gallbladder.

Her enfeebled condition would render surgery extremely risky and was not undertaken. She died two week later. A partial autopsy showed a gallbladder about the size of a small grape-fruit packed tightly in the pelvis, and it was withdrawn by some effort. A small calculus was found in the common bile duct. The duct was not appreciably dilated; the cystic duct proximally was dilated to the size of a rather large sausage; distally, just proximal to the common duct, the cystic duct was surrounded by a mass of firm tissue and an area of indurated tissue, scirrhus-like in appearance, occupied the anterior wall of the gallbladder at about its center.

The histological examination of the tissue surrounding the cystic duct shows clearly an adeno-carcinomatous structure.

Case 2.—Tumor in the cecum. The patient, P. S., female, aged 34, complained of pain in the right lower abdomen, and of feeling "all in." In 1916 while at college she was ill for three months and miserable for some time afterwards. She had pain in the abdomen at that time. She came home from school and was in bed four months with tenderness, abdominal pain, fever, and chills. Following this she was better and had no fever, but had soreness and painful spells.

Five years ago during and after pregnancy she had pain and soreness. In March of 1930 she had fever and pain. During menstruation the pain was not so bad, but soreness was present all the time. She had spells of pain off and on about every two months, which made her feel "all in." She says they were something like "labor pains."

On examination there was some tenderness in the right lower abdomen. Bimanually there was a tender mass at the right of the uterus and thickening extending laterally.

At operation a midline incision was made below the umbilicus. On opening the peritoneal cavity a tumor was felt in the cecum, and found to be movable in the cecum. The cecum was densely adherent by old tough adhesions to the uterus and right tube. On separating these, the cecum was opened and the tumor exposed. Its attachment was to the posterior wall of the cecum, but it was found that the base of the tumor was continuous with the right ovary, which was, however, partly within and partly outside of the cecum.

To visualize the condition one would have to imagine an opening having been made in the posterior wall of the cecum. The diseased ovary now inserted into the opening with a subsequent closure by adhesions of the edges of the cecal opening to the diseased ovary and a consequent closure of the cecal opening in this manner. There must have been a gradual perforation of the cecal wall by the inflammatory mass containing the ovary.

The tumor mass inside the cecum was composed of tuberculous granulation tissue with some ovarian tissue at its base. The ovary was, of course, tuberculous, as was also the right fallopian tube. The cecum, except for the mass projecting through and into its lumen, was quite normal, the mucous membrane presenting no evidence of disease.

The closure of the opening in the cecum took place without untoward happenings and the patient is now free from pain and has gained 20 pounds.

Dr. C. N. Spratt (Minneapolis) reported the following case:

I wish to show a specimen of an eye containing a piece of steel which has been there for 67 years without causing any irritation or discomfort. This man consulted me for a cancer of the larynx, when it was noticed that the right eye diverged. Upon questioning, the patient stated that when he was 12 years of age, while he was in a blacksmith shop, something hit his right eye. An X-ray showed the presence of a foreign body, and in spite of the divergence it was localized to be in the bottom of the vitreous near the ciliary body. This man died in December, 1930, and through the courtesy of the family physician and with the consent of the deceased's sons, the eye was removed. This was sectioned and I have it here.

1. It shows that a foreign body may remain in the eye without causing irritation; the eye was blind but absolutely free from irritation.
2. The shadow is definite in the X-ray—the steel in the metallic form and not oxidized. It is probably a piece of wrought iron which resists corrosion.
3. It shows that even in a diverging eye, localizing a foreign body can be accurately done.

Dr. Walter E. Camp (Minneapolis) read his inaugural thesis entitled "The Pathology and Pathogenesis of Ocular Melanomata." Numerous lantern slides were shown.

DISCUSSION

Dr. John F. Fulton (St. Paul): I am more anxious to congratulate this Academy upon having Dr. Camp become a member than to enter into a discussion of his very excellent thesis. The doctor is not only a teacher of medical students, but a very competent instructor of the oculist himself. He has very competently and thoroughly discussed tonight one of the most important and serious subjects that the oculist is called upon to deal with. The title of the thesis is somewhat misleading. Melanomata, as defined by Collins, is an innocent pigmented growth in the uveal tract which may become malignant. These apparently innocent accumulations of pigmented cells, by trauma of some unknown cause, at times take on a malignant growth of the fulminating type which may not only destroy the patient's eye, but also his life. The pigment proliferation usually originates from the epithelium of the deeper structures but may also originate from the choroidal cells.

There is a condition closely related to this, namely, melanosis, which is a deposit of pigment in structures where it is not usually found, as the cornea and conjunctiva. This condition is not necessarily malignant but is potentially dangerous, for the literature on the subject demonstrates that 30 per cent of such cases become malignant.

Dr. E. M. Jones (St. Paul) read a paper and reported cases of Phlegmonous Enteritis.

DISCUSSION

Dr. H. B. Zimmermann (St. Paul): I have never seen a case such as Dr. Jones described. In regard to the second case, not long ago I had a man come to the hospital with pain in the right lower abdomen, and fever. A diagnosis of appendicitis was made and at operation a small inflamed appendix was found. Just proximal to the ileocecal valve he had a peculiar condition. It looked like sigmoid. It felt exactly like the sigmoid and contracted normally to stimulation. The wall was about one-half an inch thick and fairly normal. It looked like a bit of intestine that had worked against obstruction for a long time. Since then he has had two other attacks of cramps in the right lower quadrant of the abdomen.

In going over the man's history, he told me that he had had a very severe attack when he was in the army. He had violent pain but the surgeons did not think it was exactly appendicitis and were rather confused about it. He got well without an operation.

I spoke to Dr. Jones about this patient and he suggested that it might have been phlegmonous enteritis.

Dr. A. R. Colvin (St. Paul): I showed a specimen here some two years ago of phlegmonous duodenitis which bears out the remark made by Dr. Jones, that this is a fatal disease. My patient was a woman who entered the hospital very acutely ill. It was thought she had some upper abdominal trouble. At operation the duodenum was found to be thickened and there was general peritonitis and a phlegmonous inflammation of the duodenum extending from the pylorus to the duodenal jejunal junction, and the mucosa was fairly studded with small superficial ulcers.

In looking up the literature at that time, I found that Melchior, writing on Surgery of the Duodenum in Neue Deutsche Chirurgie, could find only 10 cases reported in the literature. Dr. John Noble told me later that the newer references were more numerous.

Dr. John Noble (St. Paul) (by invitation): Phlegmonous inflammation of the gastrointestinal tract is a rare disease. It is found more frequently in the stomach and large intestine than in the small intestine and, as Dr. Jones has pointed out, the proximal portions of the small intestine are more commonly involved than the distal portions. While the rarity of this disease cannot be questioned, it undoubtedly occurs more frequently than the reports in the literature would indicate. In our series of autopsies at the Ancker Hospital we have seen two cases of phlegmonous enteritis. One of these Dr. Colvin mentioned and the other was the first case reported by Dr. Jones.

The etiology of the condition is not clear, but as a rule there are certain predisposing factors, the most common of which are preexisting ulceration of the mucosa, general sepsis, intestinal obstruction, or trauma. Dr. Jones' first case is evidently a manifestation of a systemic infection, while his second case appears to have followed a partial intestinal obstruction.

I think the principal value in reporting these cases is to familiarize the practicing surgeon with the gross appearance of the lesion so that he will recognize it readily when he encounters it at the operating table. Once having seen the lesion it can be confused with few other conditions. It slightly resembles a scirrhus-carcinoma but its inflammatory character and the difference in consistency make this differentiation easy. It may also be confused with a diffuse leukemic infiltration or a diffuse lymphosarcoma, but in both of these conditions evidences of inflammation are usually absent.

From the cases reported here this evening there seems to be definite clinical evidence that phlegmonous enteritis can vary considerably in intensity and that, in some instances at least, recovery occurs without radical surgical interference. The recognized surgical procedures are resection of the involved gut; or, intestinal anastomosis, short-circuiting the inflamed segment. The first procedure seems more rational since it removes the focus of infection and reduces the possibility of general peritonitis, and these cases die of a general peritonitis. The suggestion made by Dr. Jones that an enterostomy proximal to the lesion might be the method of choice in some instances, would seem to be more reasonable than a short-circuiting anastomosis.

Dr. A. E. Benjamin (Minneapolis): I want to report one case which is rather interesting in this connection, which I operated about a year and a half ago. The patient was a farmer's son, 25 years of age, who gave a history of having severe pain and distention of the abdomen, with nausea and vomiting, and some fever. The pain was not confined to the region of the appendix but more to the left and opposite the umbilicus. He came in to see me and I put him through quite an examination, including X-rays, but could not determine just what the trouble was. I decided to do an exploratory operation. A median incision, going by the umbilicus, was made and I found two sections of the lower portion of the jejunum, one about 6 inches and the other about 8 inches, covered with fibrinous exudate. This was more or less acute in character because he had just gone through an attack, and there was definite partial obstruction. There was a question as to whether or not to do a resection. I did not think it was malignant; there was no diverticulitis nor any other inflammatory condition in the abdomen that could account for this pathology. So I separated a few of the adhesions and sewed him up. He was put on a special diet and sent home. He has had one attack since, but as long as he keeps on a very careful diet, with no coarse foods, he remains in very good condition and apparently perfectly well. That was a case in which I think the right treatment was to let him alone.

Dr. Arnold Schwyzer (St. Paul): While Dr. Jones was reading his paper three cases of this type came to my mind. I wonder whether the second case Dr. Jones described was really phlegmonous enteritis. It may have been a simple inflammatory thickening. In the course of operation for acute appendicitis in two cases, I saw an area of the lowest ileum thick, fleshy and rigid. In one case this area was about 6 cm. long, ending a few centimeters above the ileocecal valve. In the other case the involved area was from 12 to 15 cm. long. We removed the appendix and the patient got well without any trouble, though we had been quite apprehensive as to the outcome. In a third case where we had a mass in the cecum we found that the process of hardening and thickening reached about 10 cm. up into the ileum. An ileocolic resection was made. The specimen showed it was tuberculosis. That case came to good recovery.

Dr. Jones (in closing): I appreciate very much the discussion of this paper. It seems that the cases Dr. Schwyzer mentions fall in the group of phlegmonous enteritis but undoubtedly of less virulence. In the second case I reported, it seems that resection would have been quite radical and therefore I just relieved the obstruction. Resection is advocated as the operation of choice, but, in view of the fact that anastomosis of the intestine above and below the lesion without resection has led to recovery, it seems to me that in cases where a resection is desirable, but not feasible, an enterostomy placed proximal to the affected bowel would be desirable.

In mild cases where one can find definite cause for the infection I believe that merely removing the exciting cause would be sufficient.

Dr. Arnold Schwyzer (St. Paul) reported the following case:

A man came to my office with a swelling in the midline in front of the hyoid and thyroid cartilages—a plain cast of cyst of the thyroglossal duct. It could be removed without breaking it. It was thin-walled, the content slimy. At the upper posterior pole toward the corpus of the hyoid bone it had been firmly adherent. We know that there is usually a little tract running through the hyoid bone, or just grazing the periosteum. It is, therefore, unsafe to leave this median portion of the hyoid bone. Sistrunk quite properly advised to follow the track of the thyroglossal duct up into the tongue. We resected the hyoid bone and found a thin tract which we followed for about 2 or 2½ cm. It could be easily demonstrated as a grayish cord-like structure. It then became very thin and tore off (shown on drawing). Not being quite satisfied, I forced the finger into the musculature of the tongue and then with one finger in the mouth I palpated the parts between the two fingers. To our surprise we found a round mass of the size of a large cherry stone. With fine artery forceps inserted into the wound, the mass was gotten hold of. It seemed to break and we saw a little lake of whitish slime. The area in the musculature of the tongue was excised with scissors. This little mass was located directly under the mucosa of the tongue. Microscopically there was a larger cyst, in the neighborhood of which there were several tortuous little tubules with pavement cell lining. The mass was located under the foramen cecum of the tongue, where the thyroid anlage originates. Had this congenital epithelial formation gone to a little further development, we would have had a lingual thyroid. It has been observed that a lingual goiter would grow after thyroidectomy. In one reported case, the tumor grew in a compensatory sense. But it grew so much that it made trouble and had to be removed and, after its removal, it seems that myxedema showed up.

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of March 5, 1931

The regular monthly meeting of the Minneapolis Surgical Society was held in the Lounge of the Hennepin County Medical Society on Thursday evening March 5, 1931. The meeting was called to order at 8 p. m. by the President, Dr. A. T. Mann. There were twenty-seven members present.

Minutes of the February meeting were read by the Secretary.

The President and several members announced the receipt of letters from Dr. Clay Ray Murray thanking them and the Society for the courtesies shown him on his visit to Minneapolis. The President also stated that the Council recommended the election of Dr. Murray to Honorary Membership in the Minneapolis Surgical Society, and upon vote of the Society this was unanimously carried.

Upon ballot the following officers were elected for the ensuing year: President, Dr. J. Frank Corbett; vice president, Dr. E. K. Green; secretary-treasurer, Dr. H. O. McPheeters (re-elected); council member, Dr. Martin Nordland.

The Scientific Program of the evening consisted of the following:

Dr. Willard White read a paper on "Traumatic Appendicitis."

DISCUSSION

Dr. J. Frank Corbett said that a number of years ago he read Kelly's book on the Vermiform Appendix and Its Diseases, and he thought the author stated about all there is to be said near the close of the book. As nearly as Dr. Corbett could remember, it was this—"Traumatic appendicitis does not occur in a normal appendix, but it may occur in an appendix that previously has been the site of an infection." Dr. Corbett was of the opinion that this was a reasonable view of the situation and brings one back to the question of latent infection that has been flared up by some unusual occurrence. He had had the opportunity of seeing only a very few cases of traumatic appendicitis but had had extensive experience down on the border in the concentration of troops. There were many hardships in long marches and knocking around and among the regular army men there was practically no acute appendicitis. Then there was another group of recruits who had been taken from civil life, and the incidence of appendicitis among these (very many giving no history of previous attacks) was extremely high. In other words, all of these men were fed the same and lived the same but the change in diet and living for these men who were not accustomed to such rough hard life was sufficient to flare up a more or less latent infection which they may have had. Dr. Corbett said that this experience which he had had made him more willing to believe that trauma is an exciting factor in the production of appendicitis in a predisposed individual.

Dr. Webb asked if some of Dr. Howard A. Kelly's fifty cases did not contain nut shells, pins, as well as numerous fecal concretions.

Dr. O. H. Wangensteen said that most everyone would concede that trauma that severs the appendix or its mesentery or that causes a bursting of the appendix would constitute a traumatic lesion of the viscus. Concerning the obstructive appendicitis which Dr. White spoke particularly about as being engendered by trauma, there is adequate cause for debate. Dr. White postulates that a blow on the abdomen increases the intraluminary pressure in the appendix in such a manner that a fecalith may become impacted in its lumen. This conjecture, however, demands proof. It is well known that no such happening occurs in acute or chronic types of bowel obstruction of the lower colon. There undoubtedly is some difference in the displacement occurring under the influence of gradual distention and that attending sudden changes of pressure. However, in simple obstruction of the sigmoid flexure, perforation or other changes such as gangrene of the proximal bowel may occur due to the distention of the proximal bowel. Shimodaira of Kocher's Clinic, in 1911, indicated that the lesion that is responsible for a simple obstruction assuming strangulation features is usually a carcinoma of the sigmoid flexure, and the perforations, ulceration or gangrene are usually observed in the cecum, occasionally in the terminal ileum, and at times in portions of the colon nearer the point of obstruction. The reason that these distention ulcers occur in the cecum is easily apparent. If one takes two toy balloons of equal size but of unequal texture and attempts to distend them by blowing, the thinner one always inflates with greater ease and ruptures more easily. Similarly, the cecum has the largest diameter of the entire bowel. The appendix, with a relatively thick wall and small lumen, would not distend easily. Dr. Wangensteen had never heard of a perforation of the appendix from an occlusion of the sigmoid flexure, though its occurrence in the cecum is well known.

Dr. Wangensteen stated that Wilkie, of Edinburgh, has pointed out that obstructive appendicitis due to the impaction of a fecalith in the lumen of the appendix is a serious form of the disease, for the appendix often ruptures before there is an inflammatory reaction around it. It would not appear, however, that Dr. White has adduced any evidence to indicate that in trauma a fecalith may become lodged and impacted in the lumen under the influence of a force exerted upon the abdominal wall. No one will dispute the traumatic origin of appendices severed under the influence of trauma but Dr. Wangensteen felt there was no evidence to substantiate Dr. White's conclusion relative to the group of cases that he has described.

Dr. Mann asked Dr. White if, when speaking of a ruptured appendix, he meant a real case.

Dr. S. H. Baxter asked if any experimental work had been done along this line. What Dr. Wangensteen has said would apply if one assumed that the cecum is distended. But if the cecum in flaccid and simply filled with fluid it is conceivable that the force would be expended equally in all directions and might be forced into the appendix and rupture the appendix itself. Dr. Baxter felt that it would be a matter for experimental work to decide.

Dr. Martin Nordland asked Dr. White if he had access to the General Hospital records in this connection. He said that in about 1913 when at the General Hospital he had assisted Dr. Wilcox in operating on a boy about eight years old who had been hit in the abdomen by a baseball. A diagnosis was made in that case of traumatic ruptured appendix.

Dr. J. M. Hayes recalled one case which was quite evidently of traumatic origin. A number of boys had gathered at this boy's home to celebrate his birthday. As they were struggling to lay him across a box to paddle him the area over the appendix was hit hard against the corner of the box. He collapsed at the time, then seemed quite well for a time. Less than an hour afterward he complained of severe pain in this area. He was taken to the hospital about twelve hours later with what appeared to be a very severe case of appendicitis. The family would not consent to an operation immediately but a little later (about 15 or 16 hours after the accident) he was opened and the appendix was found to be gangrenous in the distal half. The patient had never had an attack of appendicitis before and was perfectly well and healthy up to the time of the accident.

Dr. Mann asked Dr. Hayes if that case was one with or without pus.

Dr. Hayes replied there was no gross evidence of free pus.

Dr. Kenneth Bulkley was of the opinion that the arguments in favor of appendicitis being of traumatic origin were not conclusive inasmuch as the interpretation of the abdominal pain in most of the cases cited was not properly made. To argue that because following abdominal trauma an individual immediately developed pain and that hours or days later definite symptoms, in addition to the symptom of pain, developed indicative of an appendicitis, and that at operation a definite appendicitis was found, is not conclusive evidence that the trauma sustained was either a direct cause or an exciting factor in the development of this appendicitis. A severe blow upon the abdomen concededly causes pain, particularly if the individual receiving such a blow is not prepared for it and has not set his abdominal muscles on guard. Even with his muscles on guard the pain immediately following a severe blow may be intense. This pain is due probably not only to contusions of the skin, subcutaneous fat and muscles of the abdominal wall but quite possibly also due to contusion of the parietal peritoneum. If the blow causing this pain is of sufficient severity to cause intra-abdominal injury one of four intra-abdominal lesions is apt to result, namely: (1) rupture of the spleen; (2) rupture of the liver; (3) laceration of the mesentery; (4) pneumatic blow-out or actual division against the vertebral column of the jejunum.

Other injuries, of course, are recognized but these four are probably the most common. Dr. Bulkley had never personally seen a case himself nor did he remember having encountered in the literature a case following abdominal trauma in which on opening the abdomen direct evidence of injury to the appendix was found, with the exception possibly of such cases of severe crushing injuries in which injury of the appendix was coincidently found with multiple severe intra-abdominal injuries. Immediate pain following a blow upon the abdomen is, as already noted, probably due to abdominal contusion; and just because this patient later develops symptoms of appendicitis, it does not, in Dr. Bulkley's opinion, seem reasonable to assume that the development of this appendicitis is due to the blow. All appreciate the rapidity with which an acute attack of appendicitis may develop. Dr. Bulkley recalled vividly the instance of a young boy operated upon in a hospital many years ago for hemorrhoids. This boy had been under hospital observation for five days with normal pulse and temperature. At 8 o'clock in the morning this boy developed abdominal pain. Dr. Bulkley operated upon him four hours later, removing an appendix gangrenous throughout practically its entire length. Let us assume that an hour previous to the onset of pain the nurse had by accident dropped this boy's breakfast tray, striking him upon the abdomen. Under such conditions, the proponents of traumatic appendicitis would probably have argued that this was a case of traumatic appendicitis! If one studies carefully the histories of the cases of Dr. Kelly, quoted by Dr. White this evening, one can find but little argument, assuming the theory of abdominal contusion to be correct, to classify any of these cases as real traumatic appendicitis. It was Dr. Bulkley's opinion that development of appendicitis hours or days following abdominal trauma was purely fortuitous.

Dr. J. H. Rishmiller stated that it was the general practice to remove an apparently normal appendix when an intra-abdominal operation had been undertaken for a definite pathological entity. When opening the lumen one may find animal parasites, especially the Oxyuris vermicularis or a fecalith.

He stated that a hard blow over the right lower abdominal quadrant may easily light up a fulminating inflammation of the vermiform appendix in one who previously had considered him- or herself symptom-free Physicians are all schooled in the primary etiological factors which are the forerunners of appendicitis. In other words, one with pinworms or fecal concretions has had a definite latent appendicitis. Consequently, trauma can be regarded only as an indirect cause and not as a direct cause. Dr. Rishmiller stated that trauma was coincident with latent appendicitis, resulting in suppuration with all its possible sequences. This, Dr. Rishmiller believed, was now the general status of opinion of traumatic surgeons towards traumatic appendicitis.

He stated that so far a blow on the neck had not been claimed to have been the cause of traumatic tonsillitis nor had a blow on the abdomen, causing intra-abdominal contusion, been the forerunner of typhoid fever, but nobody knew what effect the rapid progress of the times would have on the mental attitude of the public. He had never seen a case of primary traumatic appendicitis. He had had men come to him who thought they had strained the abdominal muscles; they had pain over the right lower abdominal quadrant and some thought they had a hernia. He said it was sometimes difficult to persuade them that they had appendicitis and not a muscular lesion.

Dr. Rishmiller reported a case of indirect injury that occurred in 1910: Two men were riding on an electric truck and probably did not know what they were doing, due to the fact that they were under the influence of Bacchus, being so vivified that they ran into one of the "Soo" trains which was going at about thirty miles an hour. Both men were pitched forward. One man came out practically whole; the other had a scalp wound four inches long on the vertex. He was taken to the Swedish Hospital, where Dr. Rishmiller examined him for fracture of the skull, but could detect none. He sewed up the scalp wound, put the patient to bed and kept close watch of his cranial injury. The patient had no other external injury. His temperature, pulse and respiration had been taken with the intent of carefully watching his intracranial condition. The patient had been fairly comfortable during the night but the next morning, following a soapsuds enema, he became suddenly worse and died, and the question naturally arose, What did he die of? The speaker had talked with the man about five minutes before he died and the patient stated that he had such severe abdominal pain that he could not endure it. A partial autopsy was done which revealed a rupture of the small intestine. What had been the cause of the rupture of the intestine? This condition Dr. Rishmiller had not seen mentioned in the literature. On the right side, near the appendix, all the intestines had been agglutinated by chronic adhesions. It was his opinion that from the momentum of the patient striking on his head, the intestines had been suddenly thrown forward and then suddenly stopped, and this produced a rent in the intestine on account of the chronic adhesions, due evidently to an old lingering appendicitis. Dr. Rishmiller stated that very often we have indirect injury to deal with and this was one condition in which there was absolutely no direct injury to the abdomen. He said that indirect injury was frequently just as enigmatic as were subjective symptoms.

Dr. Webb said that two months ago the question of traumatic hyperthyroidism was discussed in this society and now it appears that appendicitis is also being included in traumatic surgery. He said that he could conceive of traumatic appendicitis if at operation the appendix were found lying across the vertebral column and injured by being crushed between the spine and some hard object.

Dr. Webb recalled the Bastedo test in which the colon was routinely inflated and then suddenly further inflated in suspected chronic appendicitis in order to elicit pain in the appendix. He had never seen any ill effects from this procedure, which was a routine test a few years ago.

Dr. Wilard White (in closing) said he appreciated the discussion and felt that the subject was important enough to warrant very careful consideration. He realized that bringing up the question of trauma to the abdomen and subsequent development of appendicitis might furnish occasion for plenty of argument in a great many cases but the main purpose of this discussion was to call attention to the fact that there really is such a thing as traumatic appendicitis and the mechanism of its production can be easily understood. He mentioned the fact that other writers, particularly Luddington, had called attention to the fact that confusion about this subject sometimes arises concerning what is meant by trauma and traumatic appendicitis. Small foreign bodies within the appendix might give an irritation to the mucous membrane of the appendix and when the appendix is removed and examined under the microscope the pathologist might return a report of foreign body in the appendix with production of a traumatic appendicitis, whereas from the clinician's standpoint this would not be a traumatic appendicitis. In this article he means traumatic appendicitis is an appendicitis which develops following an injury to the abdomen in the form of some external violence or unusual force or strain being applied to the abdomen and, as stated in the main substance of the article, this force causes increased pressure in the cecum forcing the material into the appendix. Under suitable conditions when this fecal material cannot be returned to the cecum and is retained in the lumen of the appendix, stasis results with subsequent distention of the appendix and interferes with the blood supply, so that gangrene of the wall of the appendix follows. This is what is meant in this discussion by traumatic appendicitis. It is no argument to state that many people receive blows on the abdomen and do not develop appendicitis as a result, as the condition within the appendix has to be suitable so that a definite train of events can occur.

Dr. A. T. Mann presented a case of fracture of the clavicle in which there was an auto-graft two inches long. It was four months old, and had healed firmly with a perfect line for the clavicle. The clavicle was slightly increased in size in the region of the fracture and the auto-graft, as was to be expected. (Patient present.)

The fracture at the junction of the middle and outer thirds of the clavicle had been received in a football game in which the knee of the opponent had slid under the shoulder guard and directly upon the region of the clavicle. This had broken the bone and snapped out a piece of the clavicle two inches long and almost the entire width of the bone, leaving only a thin, curved, spear-like projection on the upper margins of the two main fragments with the loose two-inch fragment between and below them with all of the parts considerably displaced.

At the time of the operation, the loose fragment was found entirely detached from all tissue and came out of the wound freely into the hand. This fragment was the best bone-graft one could have. It would fit into the defect after reduction of the displacement and it belonged to the patient with all his personal idiosyncrasies of serum and of cellular tissue. So it was used as an auto-graft. The bones were "wired" into place with forty-day chromic gut. Dressings were applied and the shoulders were fastened to a straight splint placed dorsally between them. There was firm union now at the end of four months and the clavicle is smooth and the outline seems practically perfect.

Dr. Mann stated that three months to four months seems to be the time which a bone graft of this size takes to be entirely replaced by new bone. He spoke of the care with which a bone graft ought to be handled.

Some small portions of the graft continue to live and to help produce bone although most of the graft is replaced by bone formation growing into it as it gradually melts away. For this reason he thought that, theoretically at least, a living graft is better than a preserved graft, and an auto-graft is better than a piece taken from another person or an animal because of the identity of its cells and serum reactions.

In handling a graft at the time of an operation, Dr. Mann thought there were two main considerations to keep in mind to prevent damage to the graft and loss of vitality: first, to put it into surroundings as nearly normal as possible, and, second, to prevent its becoming dry. Both of these can be accomplished by placing the graft immediately into normal saline at body temperature, sometimes, even better, by covering it completely under one of the operative flaps until it is used.

In regard to the method of bone replacement when a graft is used, Dr. Mann referred to a series of experiments made by him in 1915-16 to determine the behavior of auto-grafts of the condyles in knee joints. He read one of the conclusions given in the reprint, which referred to this question, as follows: "The main replacement of the bone in the trabeculæ seems to take place directly from bone cells without the preliminary formation of cartilage, and the dead portions of the trabeculæ seem to be absorbed in a line immediately adjacent to the new growing bone without the intervention of special osetoclasts."

Dr. R. F. McGandy read his inaugural thesis entitled "Electrical Burns and Shock."

DISCUSSION

Dr. J. F. Corbett said he would like to ask if there is any rule as to the number of hours respiration should be kept up in these cases.

Dr. A. L. Herman stated that there is one other measure which is of value sometimes in these cases and that is subcutaneous injection of oxygen. When there is merely paralysis of the respiratory muscles quite large amounts of oxygen can be absorbed. The oxygen can be filtered through sterile cotton and administered just as one would give normal salt solution. It is very readily absorbed and may tide the patient over the period of respiratory paralysis.

Dr. Mann asked whether these electrically shocked men have a change in their time of development of rigor mortis.

Dr. Webb stated that in a movie shown to the employees in the electrified section of the Great Northern Railroad the employees are instructed to keep up artificial respiration in apparently electrocuted persons even after the doctor tells them they may cease.

Dr. McGandy (in closing) said concerning Dr. Corbett's discussion that power companies have spent tremendous sums of money in order to reduce mortality rates in electrical accidents. Every man is taught the prone pressure method of artificial respiration. This teaching is not merely a lecture course, but every man is required to actually demonstrate prone pressure on his fellow employees. The greatest trouble that is encountered in this region is apparently interference by physicians who are not thoroughly acquainted with electrical shock. They usually stop artificial respiration too soon. The employees, on the other hand, are taught to continue artificial respiration until rigor mortis sets in if breathing does not start sooner. Many cases are reported where breathing followed hours of artificial respiration.

Concerning the subcutaneous injection of oxygen, Dr. McGandy stated that while it is a good measure its use is impractical. In the first place, to secure the best results it should be started and used immediately, which means that the apparatus should be in the hands of many employees. In the second place, no employee would know how to use it properly, it being a purely medical measure. On the other hand, in large institutions where a doctor is in constant attendance, it is a practical measure.

Concerning the change in time of rigor mortis, Dr. McGandy stated that in his review of the literature this question was not answered.

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

WHAT ONE NEWSPAPER DID TO PROTECT THE PUBLIC AGAINST CHARLATANS

Last July, the Philadelphia *Record* started to look into the problem of medical quackery and published a most interesting and enlightening series under the general title "Bootlegging the Healing Arts." The *Record* called for no help from the medical profession, either locally or nationally. The *Record* reports that thirty-seven cases were brought up with thirty-five convictions. (Jour. A. M. A., March 14, 1931, p. 883.)

CONSULTATION BUREAU

(Continued from Page 451)

number, no demonstrable organic change can be found (even after an autopsy), and it is necessary to write down "that the cause of death is undetermined."

4. *Question.*—I have a patient who develops a small, tender swelling in the right axilla with nearly every menstrual period. There is a small, palpable lump in the intermenstrual interval, but tenderness seems to go away when menstruation is over. What is the condition?

   Answer.—The usual cause of tender painful swellings in the axilla in connection with menstruation are nodules of supernumerary breast tissue. The treatment is removal of the mass. Such masses may be the seat of any disease common to the breast (cyst and tumor). As a general rule, they are no more apt to become malignant than similar breast tissue in the usual location.

PROCEEDINGS OF THE MINNEAPOLIS CLINICAL CLUB

Meeting of February 12, 1931

The regular monthly meeting of the Minneapolis Clinical Club was held in the Hennepin County Medical Society Lounge in the Medical Arts Building on Thursday evening, February 12, 1931. Dinner was served in the Auditorium at 6 o'clock and the meeting was called to order by the President, Dr. Moses Barron, at 7 o'clock. There were 20 members present.

Minutes of the January meeting were read and approved.

The Secretary read the Annual Report of the Treasurer, which was accepted and placed on file.

Upon ballot the following officers were elected for the ensuing year: President, Dr. F. H. K. Schaaf; vice president, Dr. A. H. Beard; secretary-treasurer, Dr. H. B. Dornblaser (reëlected).

The scientific program of the evening was as follows:

Dr. S. R. Maxeiner reported a case and showed specimen of a "Mucocele of the Appendix."

The patient, John R., 71 years of age, male, married, and by occupation retired, was first examined by us on February 7, 1931.

He had had no previous illnesses except frequent colds. Fifteen years ago he fell and developed a rupture, but had had no operation. One year ago an X-ray was taken for the present complaint, and this was negative. There was no history of tuberculosis in the family. The patient's wife had died of cancer; there were five children.

His present complaint was a painless movable tumor in the right abdomen. Four or five years ago the patient first noticed a small tumor in the right abdomen which seemed to be elusive and could be felt in different areas but was painless and small. During the past two years the tumor has progressively become larger and a little sensitive on deep pressure. There had been no loss in weight nor any gastrointestinal disturbances. The bowels moved once a day regularly without a cathartic, and there was no blood in the stools. The only complaint was nocturia two or three times a night occasionally; no frequency, but there was a great deal of difficulty in starting the stream at times. There was no hematuria; no chills or fever.

The physical examination showed a well-nourished male, 71 years of age, who did not appear acutely ill. Temperature, pulse and respiration were normal; blood pressure 110/50. The examination was negative except for the following: The throat was reddened, with tonsils present. Extremities were normal except for a large lipoma over the right thigh. Rectal examination revealed a very large prostate, hard and very smooth. There was no tumor mass in the rectum and the mass which was palpated in the abdomen could not be felt through the rectum.

There was a rounded tumor mass about 5 inches in diameter which was palpable in the right lower quadrant and freely movable from the kidney region down to the pubis. It was only slightly tender on palpation and elicited the consistency of encapsulated fluid. The second day after the patient's entrance into the hospital, abdominal palpation revealed no abdominal mass. It was only by changing the patient's position and permitting the mass to gravitate out of the pelvis that it could again be palpated. No other tumor masses were palpable. The organs were not palpable.

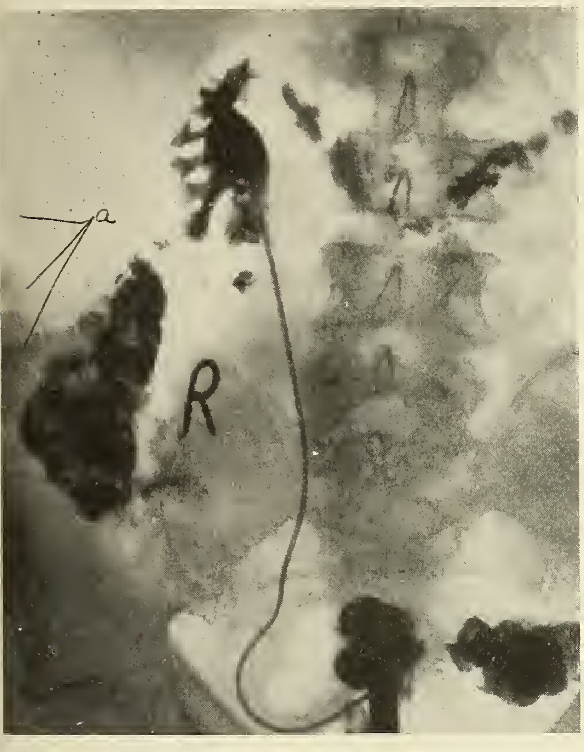


Fig. 1. Shows the colon partially filled with barium, a pyelogram of the right kidney with an opaque catheter in the ureter. The tumor is displaced downward and held by the operator's fingers (a). In this manner a tumor of the kidney could be definitely ruled out as three of the operator's fingers can be seen above the tumor and below the kidney.

The patient was admitted to the hospital on February 8, 1931. The report of the X-rays taken February 9th is as follows: "A barium enema was administered under fluoroscopic control. The solution passes all the way into the terminal ileum. There is no evidence of growth, filling defect nor any displacement of the colon from the mass within the abdomen. Conclusions: No evidence of pathology of the colon and no evidence of displacement of the colon by the intra-abdominal mass."

On February 10, 1931, on account of the history of difficulty in starting stream, the finding of an enlarged prostate and a great deal of pus in the urine, and in spite of Uroselectan, it was deemed advisable to do a kidney examination. Cystoscopy revealed a very large prostate with a moderate degree of cystitis. Both ureteral openings were normal. Specimens from each side revealed only a few pus cells. A pyelogram of the right kidney was made, using 7 c.c. of 30 per cent solution of sodium iodide. Report: "A pyelogram was made of the right kidney. This shows no defect in the pelvis or calices. Conclusions: Normal right pyelogram."

The preoperative differential diagnosis rested between chylous cysts, enteric cysts, intraperitoneal cysts of nephritic origin, and dermoid cysts or teratoids as classified by Ewing. A cyst in this instance might have involved the peritoneum, the mesentery, or the omentum.

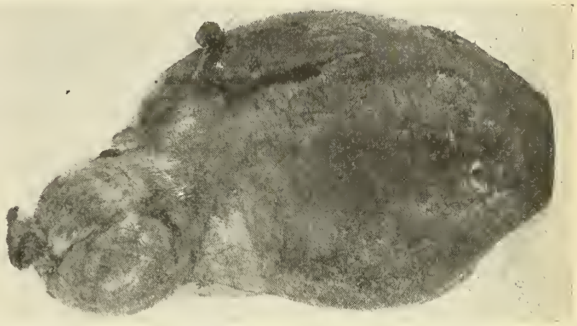


Fig. 2. Mucocele of the appendix. At the end is the ligated base of the appendix; in the midportion the ligated mesoappendix. The mesoappendix can be seen to run along the superior surface.

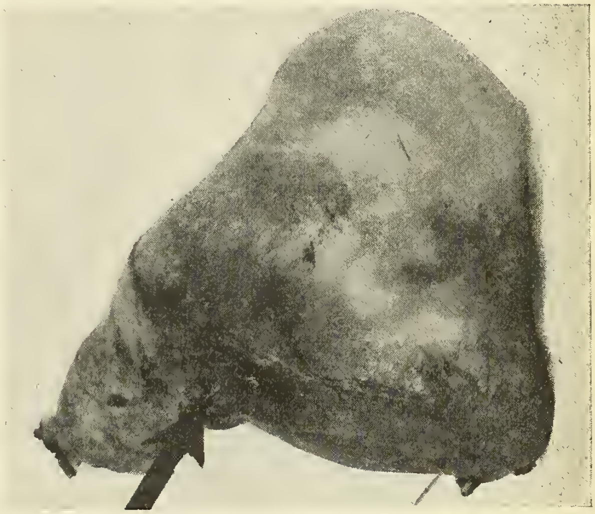


Fig. 3. A side view of the tumor showing the enormous dilatation that had taken place, and the extremely thin wall is suggested by the whitish area. The tied off mesoappendix is designated by the arrow.

Operation: Under local anesthesia through a right rectus incision, the abdomen was opened and a large white tumor resembling in appearance an ovarian cyst was found to lie within the pelvis. The mass was delivered and adhesions between it and the ileum, cecum and omentum were separated and, after a very careful check, the tumor was found to be attached to the cecum by a small stem and to have a mesentery so that the mass was immediately recognized as an enormously dilated appendix. The mesoappendix was clamped and tied and the base treated in the usual manner for an appendix. The abdomen was closed without drainage and the patient made an uneventful recovery.

Pathological report: Section from mucocele of appendix: "The walls of the appendix are much thinned out. Muscle layers are indistinct and show a hyaline-like degeneration. It is lined with a columnar epithelium. There is some infiltration with lymphocytes, some plasma cells and eosinophiles."

The gross specimen measured 5 inches in length and 3 inches in thickness.

DISCUSSION

Dr. R. G. Allison: The mass was freely movable and was moved with the bowel. We felt, as Dr. Maxeiner did, that it was probably a mesenteric or omental cyst.

Dr. Moses Barron: I have seen two other specimens just like this one. The specimen is typical of mucocele of the appendix. The lumen of the appendix is markedly distended and the wall very much thinned. It contains a mucoid substance and might be considered a retention cyst of the appendix.

Dr. Allison: I would like to ask just what is the difference between a mucocele and a cyst?

Dr. W. E. Camp: I think they are essentially the same; the mucoceles I have seen are simply cysts with very thin walls.

Dr. C. A. McKinlay reported a "Case of Pulmonary Abscess Following Tonsillectomy, Terminating in Fatal Hemoptysis." (To be published in the Journal-Lancet.)

DISCUSSION

Dr. A. H. Beard: I think Dr. Camp had a case similar to this, where the sinuses were involved and the patient had an abscess in the chest. Tubercle bacilli were not found in the sputum but rest in bed for a period of a month or two cleared the condition. Local anesthesia was used in that case.

Dr. W. E. Camp: That was an acute sinus case. The patient had an acute posterior ethmoiditis and sphenoiditis. The antrum was irrigated, but found clear. We went into the posterior ethmoid and sphenoid and found thick creamy pus in both. The patient got along very well for five or six days, then developed an abscess in the right lung that manifested itself by a large frank hemorrhage. The abscess drained well, and healed without further trouble. After leaving the hospital the patient developed a paralysis of the external rectus of the right eye. This disappeared gradually, and she has been well ever since.

Dr. F. W. Wittich: I saw one case like this about five years ago, of a dentist's wife who had almost a parallel history. She had a tonsillectomy under local anesthesia and developed a pulmonary abscess with repeated profuse hemoptysis, dying from a hemorrhage. I am inclined to think that these cases are not due to direct aspiration under local anesthesia but that they are mostly blood-borne affairs. I would like to raise that question whether any other members have had any evidence on the subject. Where the suppuration is quite extensive hemoptysis may be very sudden and fatal.

Dr. F. H. K. Schaaf: In favor of Dr. Wittich's suggestion that these cases may be blood-borne, I can cite one case which occurred at the University Hospital. This boy had had a sore throat but no operation. A few days later he had a profuse hemoptysis and subsequent lung abscess. He recovered.

Dr. Kenneth Phelps: I would like to report the case of a child who had tonsillectomy under general anesthesia and later developed some trouble in the chest. It was several weeks before a diagnosis was made. The child had had a tooth knocked out and the trouble was due to this foreign body in the lung. It resulted in gangrene of the lung. Bronchoscopy did not save the child's life.

Dr. Moses Barron: I do not believe that it has yet been settled whether the lung infections following tonsillectomy are due to aspiration or are blood-borne. Pathologically it is difficult to decide. If the infection is blood-borne, why is it that the abscess is generally single and not multiple? It may be from a small mass of material in the tonsil. The difference between the two conditions is that in the case of a caseous gland which ruptures into a bronchus it keeps feeding the bronchus for a considerable period of time, while in the case of a tonsil it does this only momentarily. The caseous gland consists of a mass of necrotic tissue surrounded by a wall of tuberculous granulation tissue. This tuberculous granulation tissue contains the infecting material and will continue throwing off the bacilli long after the first rupture takes place. This is why one can get a bronchogenic pneumonia from a ruptured caseating lymph node. In the case of a tonsil, the condition is entirely different. The infecting material is given off only momentarily and abruptly. For that reason even if it spreads into the bronchi the abscess would be only a single one.

Dr. C. A. McKinlay: It is not so much to be wondered at that pulmonary and pleural suppurations occasionally follow tonsillectomy, but that they do not occur more frequently. For under either local or general anesthesia aspiration of material from the throat may occur unless, and even if, all possible precautions are taken in regard to the position of the patient, to the clearing of blood and mucus from the throat, and to the degree of tissue infiltration or of general anesthesia.

Dr. Moses Barron (in closing the meeting): I certainly wish to thank all the members of the Society for the honor and privilege of being president of this organization during the past year. It has been a distinct pleasure to occupy the office this year because of the support from all the members. I think that one of the great features of this organization is the fact that we come together here for sociability as well as for carrying on discussions in clinical medicine, and the trend has been that the better we are acquainted with one another the better we get along. The present group of officers is turning over the organization to the new officers in very good condition, both from the social and the financial standpoint. The financial report this evening quite surprised me. We undertook several things this year which involved considerable expenditure of money and yet we end the year with a good balance in our treasury. The excellent support from the members has resulted in properly fostering good fellowship as well as a better understanding of scientific medicine. I wish again to thank you for the confidence you had in me in electing me your President.

And now as to my paper this evening, since the discussion on Nephritis is rather a long one, and since it is nearly time to close the meeting, I think it would be better to postpone this paper until the next meeting. (Upon vote, a motion was carried that the paper by Dr. Barron on "Present Day Conception of Nephritis and Its Treatment" be carried over to the next meeting.)

The meeting adjourned.

H. B. Dornblaser, M.D., *Secretary.*

Meeting of March 12, 1931

The regular monthly meeting of the Minneapolis Clinical Club was held in the Hennepin County Medical Society Lounge on Thursday evening, March 12, 1931. The meeting was called to order about 7:15 by the President, Dr. F. H. K. Schaaf. There were 22 members present.

Following a short business meeting, the following scientific program was given.

Dr. William P. Herbst (by invitation) read a paper, illustrated with lantern slides, on "The Motility of the Upper Urinary Tract," and a study of the various functional disturbances of motility which open up a new field for the surgical treatment of various painful renal and urinary syndromes.

ABSTRACT OF DR. HERBST'S PAPER

Adequate drainage of the urinary tract, which is dependent mainly upon its motility, is, outside of excretion, the most important phase of the physiology of this tract. This tract has an inherent control mechanism which functions satisfactorily when severed from its connection with the central nervous system. This applies to its excretory function as well.

We have accurate knowledge of the action of certain drugs on the motility of the urinary tract gained from direct fluoroscopic observation. The usual urogram is a composite picture of multiple superimposed phases of motility.

Intravenous urography, when satisfactory, produces a picture not influenced by the over-distention nor incomplete filling incident to ureteral catheter injection. We have available a method of examination in pyeloscopy (fluoroscopic visualization of the motility of the urinary tract) that is relatively as satisfactory as fluoroscopic examination of the esophagus, stomach, small intestine, and colon, which makes possible the recognition of abnormal neurogenic functional mechanisms corresponding to such conditions as cardiospasm, spastic colon, Hirschsprung's disease, auricular fibrillation, and all types of obstructive pathology.

Eserine appears to offer relief in conditions of mild and transient pain due to certain of the functional disturbances in motility secondary to abnormal sympathetic influence.

There lie before us surgical procedures which promise much for the relief of very distressing types of renal and ureteral pain and various accompanying functional motility disturbances; also certain cases of chronic glomerular nephritis which are not making satisfactory progress under medical supervision and therapy. We have an explanation of the diametrically opposed views on the proper treatment of nephroptosis and the so-called ureteral strictures.

A number of slides were shown illustrating the mechanism of the motility of the urinary tract and also from a number of cases which were diagnosed as having definite functional motility disturbances of the upper urinary tract, with the diagnostic and therapeutic data.

Dr. Moses Barron then gave his Presidential Address, entitled, "The Present-day Conception of Nephritis."

ABSTRACT OF PRESIDENT'S ADDRESS

There is a great deal yet to be learned in regard to nephritis, but the recent work on this disease has clarified many of the complicated problems.

The term "nephritis" is used to designate that condition in which the glomeruli are quite generally involved throughout the kidney, the so-called glomerulonephritis. (Slides were shown to present the relationship between the diffuse glomerular nephritis and other kidney lesions.) In a general way the classification subdivided kidney affections into:

1. Benign albuminurias
2. Nephroses
3. Malignant hypertension
4. Senile arteriosclerotic kidney
5. Nephritides

Under the last subdivision was included, as a further subdivision, the diffuse glomerulo-nephritis.

The etiology of the disease is uncertain. According to Volhard the true hypertensions may be subdivided into the "red" hypertension or the so-called essential hypertension, and the "pale" hypertension of nephritis. His concept as to the pathogenesis of the latter is that there is a general systemic arteriolar and perhaps capillary constriction in which the glomerular capillaries and arterioles necessarily take part. The early change is a spasm of the arterioles with ischemia of the functional glomerular elements. The substance causing the constriction supposedly circulates in the blood, at first originating in the toxins of some infection in the throat or other parts of the body; later the constricting substance is elaborated in the kidney. According to Dr. Bell, the changes in the glomeruli are also brought about by an infection, but the glomerular changes are due to the direct effect of the bacteria and their toxins. He shows the presence of leukocytes and the proliferation of the endothelial cells as well as the epithelial cells in the glomeruli to substantiate his theory.

But whatever the original cause, the progress of the disease results in a gradual increase of fibrils and cellular elements and finally connective tissue in the glomeruli, with a gradual closing off of the capillaries and consequently a progressive ischemia. This finally goes on to kidney insufficiency.

The best tests for kidney insufficiency are the concentration and dilution tests. The former shows the functional ability of the kidney to concentrate the urine over and above the molecular concentration of the de-proteinized serum. In the advanced stages of kidney insufficiency, this ability is lost and the urine maintains a constant specific gravity of 1.010, which is that of the de-proteinized serum. This is known as isothenuria. The normal kidney can concentrate at least to a minimum of 1.025, and usually higher. The importance of this ability to concentrate lies in the fact that the present-day concept of renal function (Cushney, Richards) assumes that the urine as elaborated in the glomerular spaces is a simple filtrate of de-proteinized serum. This urine, serum minus the colloids, is concentrated in passing through the convoluted tubules by the resorption of water (and certain threshold substances such as glucose). This ability to concentrate is apparently decreased through the progressive loss of the functioning ability of an increasing number of the secretory elements—the glomeruli with their tubules.

The next stage of kidney insufficiency is when it is unable to dilute. The normal kidney can dilute the urine, following the ingestion of 1,000 to 1,500 c.c. of water, to as low as 1.002 or even 1.001. Later the products of metabolism may be retained in the blood serum as is revealed by the blood chemistry.

The edema which may accompany the nephritis is not directly renal in origin, but may be considered as extra-renal.

The acute stage of nephritis may go on to recovery with complete restitution, or to death either from cardiac decompensation, uremia, or secondary infections. Some cases go on to chronicity and then may become either subacute, subchronic, chronic, or recurrent. Recovery after one year's duration of the nephritis is rare; after two years, practically never.

The treatment during the acute stages is to limit the fluid intake according to the patient's ability to excrete, restricting the protein intake to 20 or 40 grams a day, and to give a high carbohydrate diet rich in fruits and vegetables, salt intake to be limited to obviate edema. The three-day starvation diet of Volhard may be tried, followed by his so-called "Wasserstoss." One must be careful in using the latter procedure. Diuretics are of very little importance.

A number of charts were shown to illustrate the normal structure of the glomerulus as well as the pathological one in nephritis. A large series of very beautiful photomicrographs taken from glomerular nephritis in various stages were shown. These were obtained through the kindness of Dr. E. T. Bell, of the Department of Pathology of the University of Minnesota.

There was no discussion of either paper.

The meeting adjourned.

H. Bright Dornblaser, M.D., *Secretary.*

"A train of thought may die away without any recognizable external result of any kind. When Archimedes invented his test of specific gravity, he ran into the street and shouted; but in the preceding twelve months he must have done a good deal of thinking that left his muscles passive."—*Graham Wallas.*

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg.
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg.
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

MYOPIA FROM THE POINT OF VIEW OF HEREDITY. Ejler Holm, Acta Ophthalmologica, Vol. III, Fasc. 4, Pages 335-347. It has long been known that heredity plays an important rôle in the etiology of myopia. In order to determine the relationship of heredity to myopia, Jablonski in 1922 studied the difference of refraction in twins of the same sex (some were unioval, the others were not). In the unioval twins in whom the hereditary influences could be considered equal, the difference of refraction was not more than two diopters. However, this does not indicate that external influences can not affect refraction more than two diopters, as his material was too limited. Only two cases of myopia were included in Jablonski's work.

Tscherning first pointed out that there was a possibility of two kinds of myopia. The first depends on near work and does not exceed six diopters; the second depends on hereditary factors and is over nine diopters. Reading myopia, however, is probably dependent on hereditary factors which are present in non-readers to an equal extent as in readers, but which are manifested more frequently in the readers.

Jablonski in his study of pedigree arrived at the conclusion that myopia is a recessive hereditary affection. His work was done on patients who were largely non-readers, therefore his results cannot be considered as a support of the assumption that myopia is always a purely hereditary affection independent of near work and other external conditions.

Very little attention has been given to reading-myopia from the standpoint of heredity. In a series of case reports the author attempts to show that reading-myopia depends upon heredity. The author believes that the hereditary factors for reading-myopia as well as the other type not dependent on reading should be the same. There may be a whole series of multiple specific hereditary factors for myopia so that a single one of them may be able to produce myopia under external conditions which are favorable to its development; while, if a greater number are present, myopia may occur irrespective of external circumstances. Thus, myopia occurs more frequently in families whose members read much and less frequently in families whose members do not read much.

James Brusegard.

USE OF INSULIN IN POST-OPERATIVE MASTOIDITIS. Matthew S. Ersner, M.D., and Joel J. Pressman, M.D. (Ann. of Otol., Rhinol. and Otolaryngol., Volume XXXIX, December, 1930, Number 4). This article discusses briefly the rationale and the results of the use of insulin in the post-operative treatment of acute mastoiditis. In this series of cases none were diabetic, but all showed a greater or lesser degree of debilitation, with poor tissue repair and a prolonged period of healing. Poor appetite and nutrition were invariably present. It is the belief of the authors that graded administration of insulin greatly improves metabolism, increases appetite and nutrition, and, in this way, breaks into the vicious circle of debility and prolonged suppuration.

After the use of insulin, without exception there was a marked increase in appetitie, with gain in weight and well-being. The wound granulations took on a more healthy appearance and repair went forward at a normal and satisfactory gait.

Children were given single daily doses, one-half hour before lunch, the initial dose being 3 units, increased rapidly to 5 or more. They believe the diet should lean more toward fats than carbohydrates, but an ample amount of the latter is absolutely essential.

In this series treatment was not started until the seventh post-operative week, at which time there was active suppuration and little attempt at healing. Drainage decreased rapidly and healing began, hand in hand with the improvement in the general condition.

Their conclusions are as follows:

1. Many post-operative cases of acute mastoiditis are in a generally debilitated state from prolonged illness and operative procedure.
2. This state of debilitation often prevents the proper healing of wounds.
3. Insulin injections have a decidedly tonic effect upon such cases.
4. Increased appetite, gain in weight and improvement in general health result in increased rapidity in healing.

M. W. Wheeler.

THE MAXILLARY ANTRA AS FOCI OF INFECTION. C. B. Williams, M.D., Mineral Wells, Texas (Ann. of Otol., Rhinol. and Laryngol., Volume XXXIX, December, 1930, No. 4). The author first states the objects of his paper, which are twofold:

1. To present evidence from recent literature and case reports from our records supporting the idea that maxillary antra commonly act as foci of infection.
2. To stress the importance of careful routine examinations of these regions when searching for the cause of conditions which are generally supposed to be due to such foci.

RECENT LITERATURE

A consideration of recent literature reveals that quite an advancement has been made within the past few years in our method for determining diseased conditions of the maxillary antra and that a pronounced tendency toward conservative treatment of all the naasl sinuses, except possibly the antra, is quite apparent.

The author next gives a group of excerpts and notations from recent articles which give an idea of the many and varied diseased conditions which are being attributed to infected sinuses in general. In this group are case reports covering the following diseased conditions: Myocarditis, chronic bronchitis and perennial asthma, retro-bulbar neuritis, chorea, vertigo, headache, cough, profuse nasal discharge, eye disturbances, anemia, dizziness, constant cold in nose and discharge, foul breath, headaches and trifacial neuralgia.

The author next reports cases of his own attributed to antral infection which include the following conditions: 1. Persistent corneal ulcer. 2. Facial paralysis. 3. Tic douloureux. 4. Acute arthritis.

The author comments that infected antra can be and often are responsible for these different diseased conditions, and that it is certainly important that we make it our habit to routinely investigate the antra in every case that comes under our care; that patience and skill are often required to arrive at a fair conclusion as to whether an antrum is infected; that allergy, through blocking, should always be kept in mind.

He summarizes by stating that from different sources in recent literature and his personal experience of over 30 years, evidence is gleaned that any diseased condition which may arise from a focus of infection anywhere in the body can and often does arise from diseased maxillary sinuses. This being true, the antra should be routinely investigated when searching for foci of infection.

The article is concluded with the mention of a recent article by E. M. Anderson (Anderson, E. M., Jour. A. M. A., June 14, 1930, p. 1889) of Rochester, Minn. The author states, "I mention this article only to express my hearty disagreement with its general import. Under 'Summary and Conclusions' among other things Anderson states that 'suppurative sinusitis may be a focus of infection on rare occasions.' I do not feel that this view by any means expresses the consensus of opinion of present-day otolaryngologists."

Lucian G. Culver.

MEDICINE

TUBERCULOSIS ABSTRACTS*

What rôle does calcium play in the healing of tuberculous lesions? Does the deposit of calcium hasten the reparative process or does it but replace destroyed tissue? No other mineral element has been so thoroughly investigated in tuberculosis research as calcium. Attempts to influence the course of tuberculosis by the therapeutic use of calcium have repeatedly failed. But more recent knowledge about nutrition and heliotherapy has revived interest in the subject. Calcium metabolism is undoubtedly influenced by vitamins and by certain rays of the solar spectrum. A general review of the calcium question should be helpful in evaluating the claims and theories of recent writers. The following notes are derived from the November, 1930, *American Review of Tuberculosis*, in an abstract of a paper by R. Monceaux in the Revue Belge de la Tuberculose.

CALCIUM EXCHANGE IN PULMONARY TUBERCULOSIS

Boyer, in 1869, declared that the lung undergoes a decalcification in phthisis, but it is chiefly to Ferrier that latterly accepted theories are to be credited. Ferrier's experiments were crude and his evidence was not convincing, but he added other arguments that had to do with the relation between dental caries and bony demineralization, the calcium reserve, and other suggestive observations. Most French authors contend that decalcification begins in the early stages of tuberculosis and disappears in advanced cases. This they determined simply by estimating the amount of calcium excreted in the urine. Robin gives the normal urine calcium as 0.281 gms. per day.

COMMENT ON DECALCIFICATION THEORY

To consider only the degree of calcuria is very misleading for it may vary from 0.16 to 0.69 gms. on an identical regimen. In fact, most of the calcium is ordinarily excreted in the feces. The only really scientific method of estimate is to determine the calcium balance or relation between total intake and output. This has been done in tuberculous patients, at rest and on a measured ration, and a negative balance was found in certain patients in whom active disease caused wasting. In these cases, a dose of 2 gms. calcium oxide per day was necessary to compensate the loss. Except for these conditions, tuberculous persons behaved about normally and consumed daily about 1.5 gms. calcium oxide. Hence, it was concluded that decalcification is not a specific characteristic of tuberculosis but is associated only with denutrition. One investigator even found positive balances in a number of tuberculous persons.

Ferrier declared that dental decalcification went hand in hand with body decalcification. Others have been unable to confirm this, and Villemin pointed out that in rachitic children dental lesions were rare.

Barkus was unable to determine any loss or any increase of calcium as cure occurred and in guinea-pig experimental tuberculosis could not demonstrate any diminution of calcium. Others even found an increase in animal necropsies, and some have shown that the calcium content of organs varies with the physiological state.

CALCIUM IN THE BLOOD

Recent studies have been made on the blood calcium. Tuberculosis *per se* causes no lowering of blood calcium. Hemoptysic patients with prolonged coagulation time showed slightly lower concentrations but the differences were slight. The normal variations are from 9.22 mgm. per 100 c.c. serum to 10.78 mgm. From 120 to 130 mgm. per litre were found even in cavity and bronchopneumonic cases. The tuberculous blood is not impoverished in calcium. Moreover, variations, when they exist, are dependent on cachexia and alimentary insufficiency.

RECALCIFICATION

In spite of these objections, the dogma has been reiterated that the great curative principle in tuberculosis is recalcification. This is carried out (1) by administering calcium phosphate and other salts and (2) by instituting a diet regimen. The only demonstrable advantage of calcium medication is that it may act favorably on the stomach, which often in the tuberculous shows hyperchlorhydria. Calcium lactate given by mouth does not increase the blood calcium, nor will a calcium-rich dietary increase tissue calcium. In fact, in the tuberculous, calcium chloride or lactate may even increase calcium loss, especially the chloride. The glycerophosphates and carbonates are not assimilated at all and even increase calcium loss. Phosphorus and calcium have a certain optimum relation, realized in the tuberculous when there is a slight excess of calcium. If this is exceeded, there is a tendency to the formation of insoluble calcium phopshate, which is eliminated by the intestine—therapeutic decalcification. Calcium therapy might be useful when there is insufficient alimentary calcium, as in Germany during the War, but metabolic disorders cannot be combated; that is, the organism cannot be made to fix calcium. Superfluous quantities are rapidly precipitated in the tissues for the blood is normally physiologically saturated.

FIXATION OF CALCIUM

It was believed that the addition of adrenalin would solve the problem, and two workers diminished calcuria under this regimen. However, these results have been questioned and it has been shown that there is always a corresponding intestinal debit. Solar ray, ultra-violet radiation, and Vitamin A have been used but without effect. In rickets, only the ultra-violet rays and cod liver oil containing Vitamin A protected animals, but this condition differs essentially from tuberculosis.

---

*Reprinted from Tuberculosis Abstracts, a review for physicians issued monthly by the National Tuberculosis Association. February, 1931, Vol. IV, No. 2.

CALCIFICATION OF TUBERCLES

Calcium deposits in tubercles have been accepted as obvious proof that calcium plays a defensive rôle by walling off bacilli. However, calcium salts are only deposited in necrotic tissue. Calcium does not precede nor favor cicatrization of lesions and probably does not even arrest the progress of lesions. It is much more probable that calcification follows rather than effects a cure. In bovine tuberculosis, large quantities of calcium are deposited in and about progressive lesions. Also, bony tissue offers no special resistance to tuberculous infection.

Individuals who breathe lime dust all day possess a special resistance to tuberculosis. This is incontestable. But its action may well be a simple mechanical one, simulating sclerosis.

Calcium salts do not inhibit the development of the tubercle bacillus; on the contrary, they often favor growth on culture media. Neither has any favorable effect been noted in tuberculous animals.

CONCLUSIONS

If there is no decalcification, still the tuberculous need a little more lime than normal persons to maintain a favorable balance. Calcium may stimulate phagocytosis and certain other favorable reactions. However, intensive calcium therapy, on the basis of the foregoing work, must be rejected as useless. Nature furnishes abundant calcium, especially in water, milk, eggs, and legumes. The best alimentary medium is milk, of which 0.5 litre per day, with leguminous purees or eggs, suffices. Articles which tend to precipitate calcium in the form of oxalates—rhubarb, sorrel, cocoa, endive—should be avoided. If in the presence of food rich in calcium it is not assimilated, the organism is at fault physiologically. This is often the case in tuberculosis, especially when oxidation is impaired, with a resultant tendency to humoral acidity. In such cases, phosphoric acid may be given, which indirectly favors retention of calcium. The biphosphates and lactophosphates can also be used.

Basic Feeding in Tuberculosis

Mayer and Kugelman, in a preliminary report on "Basic (Vitamin) Feeding in Tuberculosis," Journal of the American Medical Association, December 14, 1929, attempt to evaluate the special dietary regimen for tuberculous patients advocated by Sauerbruch and Gerson. They declare that dogmatic statements are not not yet warranted but admit that the favorable results observed in about one-third of the patients studied may perhaps be attributed to the effect of the dietary.

The authors maintain that the special dietary is an alkali-forming one and not acid-forming as the Germans contend. Experimental studies on the effect of acid and base-forming dietaries in rats show that animals on the base-forming dietary throve to a maximum degree, grew rapidly, and were more active than those on the acid-forming diet. Similar studies on patients showed that the acid-base equilibrium shifted toward the basic side on base-forming diet. They believed that the inorganic constituents and the vitamins are the favorable factors and that the vitamins are the more important. The absorption and utilization of minerals depend on the vitamins present in the alimentary tract.

DEVELOPMENT IN THE PROBLEM OF ARTHRITIS: Ralph Pemberton, Philadelphia (Jour. of the A. M. A., January 3, 1931). The medical profession has not seriously regarded the problem of arthritis even though it involves a large percentage of the population. However, the profession is coming to recognize the two main types of the disease, namely the atrophic and hypertrophic, and to give varying emphasis to the etiologic and therapeutic factors bearing upon them. In Europe today there is a large movement for the study and treatment of this disease, and coöperating with this movement is the American Committee for the Control of Rheumatism. Dr. Pemberton stresses the fact that arthritis is a systemic disease; that the background for it is often hereditary; that certain types of persons are most frequently attacked; and that there are prodromes that enable one to recognize susceptible individuals and often prevent the disease, especially perhaps in the atrophic type. The problem of infection, of which so much has been heard in recent years, seems to be in many cases only the precipitating agent, and sometimes rather frequently focal infection is the result of the background rather than the cause of it.

Physicians are paying more attention to the question of a disturbance of the finer blood supply to the various parts of the body, and which bears a definite relationship to both types of arthritis. Definite proof of this conclusion is to be found in studies of the blood gases, study of the rapidity with which the circulation in arthritic patients takes care of substances absorbed into it from the digestive tract, and in the study of the blood count in the blood first issuing from the capillary beds at the periphery in the arthritic subject. Studies of the surface temperature of arthritics show that they have a lower peripheral temperature because of the decreased blood flow in the tissues concerned. The capillary bed appears to be immobile and in a state resembling vasoconstriction. This is probably the explanation of the added discomfort expressed by arthritic patients from changes in the weather.

He again stresses the fact that it is a variety of factors which contribute to bring about the disease and that no agency or organism is recognized as the single cause of it; and that attacking this problem with any drug or any vaccine alone is too often like firing at the head above the ramparts instead of the fortification itself. It is the opinion of most of the American Committee for the control of this disease that the physician must focus his attention on the disease as a whole rather than focusing it on any one factor, whether it be mechanical, bacteriologic or nutritional.

Even irregular practitioners have begun to treat this disease with a breadth of view that some of the leaders of medicine do not entertain, and "is the medical profession to allow to be repeated here the experience in the field of physical therapy, in which the laymen and the quacks almost alone kept alive therapeutic principles rediscovered fifty years later by orthodox medicine?"

Richard Bardon, M.D.

PEDIATRICS

FACTORS INVOLVED IN COMBATING THE "HUNGER STRIKE" IN CHILDREN: William Palmer Lucas, M.D., and Helen Brenton Pryor, M.D., San Francisco (Amer. Jour. of Diseases of Children, Vol. 41, No. 2, February, 1931). The main complaint of anorexia presented by the 110 children was accompanied by constipation in forty-six cases and by indigestion, abdominal pain or vomiting in eighteen cases; thirty-six suffered from styes, boils and frequent infections; sixty-two were underweight, and forty-one of these were described as overactive or highstrung, easily fatigued and irritable. Extremely high rates of basal metabolism accompany and possibly explain the nervous type of overactivity which results in this fatigue and irritability. Psychologic examinations of a number of this group indicated intelligence higher than the average.

Enforcing abundant rest is effective in overcoming problems of behavior as well as important in the treatment for anorexia. Our regimen of rest provided for breakfast in bed, getting up at 10 A. M., being out of doors in the sunshine if possible until noon, a nap from 1 to 3 P. M. and going to bed at 7 P. M.

Functional versus organic types of anorexia have been discussed by Bartlett, Schlutz, Carlson, and others. The deleterious effect on the appetite of a high proportion of fat in the diet has been well described by Aldrich, who said that all foods rich in fat pass out of the stomach slowly, and that "The stomach tends to be low and to empty slowly in all patients with poor muscular development, especially in those of slender type." Poor appetite in itself causes a decrease in the secretion of gastric juice, and therefore may delay the digestion and emptying time of the stomach.

McLean and Fales have pointed out that "the thin underweight child requires considerably more food than the normal allowance." Conversely, the fat child requires less than the normal because of lowered basal metabolism, and because of diminished needs for body building. The author's experience leads him to agree with Garland, Aldrich and others that milk should be eliminated from the diet or be greatly reduced in amount, as a first step in dealing with anorexia. The author substituted a quart of fruit juices for the usually accepted quart of milk.

In the 110 cases of anorexia reported, the author has had good results after from six weeks to three months on diets of low residue, low fat and high vitamin content, or on diets of low fat, low starch and high vitamin content, combined with a regimen of rest and special therapy indicated.

Body measurements established the fact that 82 per cent of 110 children complaining of anorexia, had the linear type of build.

Obstinate constipation had a high correlation with poor nutrition in the linear type in this series.

Diets high in fat content commonly fed to underweight children are contraindicated for subjects of the linear type.

Children of the linear type should be given diets with a low fat content.

The substitution of one quart of fruit juices for the one quart of milk a day usually prescribed has a stimulating effect on the appetite.

A diet of low residue successfully combats persistent constipation associated with mild distention of the colon.

R. N. Andrews, M.D.

LOW FAT HIGH STARCH EVAPORATED MILK FEEDING FOR THE MARASMIC BABY. John Howell West, M.D., Easton, Pa. Arch. of Ped., Vol. XLVIII, No. 3, March, 1931.

The most difficult feeding problems encountered by the pediatrician in the care of the artificially nurtured infant are probably found in the so-called marasmic group. These babies suffer from a severe form of malnutrition, designated by Finkelstein as the state of decomposition.

Nobecourt thinks that there is marked intolerance for fat, while Grulee suspects that the sugar element is at fault, as many of these babies have been fed on sweetened condensed milk. Pacchioni believes that there is a deficient functional activity of the body cells themselves which prevents adequate assimilation. Finkelstein, in 1922, advanced the theory that cow's milk causes an injury to the intermediary metabolism. Suffice to say that there is an apparent intolerance for fat and soluble carbohydrates with an almost complete lack of the assimilative function.

His feeding problem, it appears, is to supply a readily digestible high caloric type of feeding with a low fat and sugar content. Modified unsweetened evaporated milk furnishes such a food. Evaporated milk is practically a double strength whole cow's milk. Its virtue lies in the homogenization of its fat with resulting breaking up of the large fat globules of plain cow's milk into tiny droplets resembling the fat of human milk. A very important argument in favor of this type of feeding, and one not sufficiently stressed, is the fact that evaporated milk may be fed and digested in much stronger dilutions than plain cow's milk, and so provides the additional calories frequently required to put the baby "over the top" nutritionally. By dilution the fat and soluble carbohydrate content may be reduced to the desired low percentage, and the caloric value may be increased to any desired point by the addition of protein in the form of calcium caseinate and starch in the form of baked wheat or barley flour.

The marasmic infant is frequently started upon a formula containing four ounces of evaporated milk in a 32-ounce formula. In order to increase the calories of the mixture, however, as well as the protein percentage, one ounce (three heaping tablespoonfuls) of calcium caseinate is added which increases the protein content to 3.8 per cent., approximating that of Finkelstein's original protein milk. The carbohydrate is increased four and one-half per cent by adding one and one-half ounces (three rounded tablespoonfuls) of baked wheat or barley flour. As the baby thrives, the fat is cautiously increased by adding one-half ounce of milk and removing a similar quantity of water from the mixture. The sugar of choice has been lactose because of its pronounced effectiveness in increasing calcium absorption, and also for the reason that it favors the development of excellent tissue turgor. As the weight curve goes up, one-half ounce (one rounded tablespoonful, 60 calories) of lactose may be added, removing the same amount of flour. As the tolerance for sugar improves, the lactose is gradually increased to one and one-half ounces (three rounded tablespoonfuls). The resistance to infection while on this feeding plan appeared excellent.

The marasmic baby is usually intolerant to fats and sugars, and for this reason does not do well on the ordinary raw or cooked cow's milk dilutions with soluble carbohydrate additions. A very digestible high caloric type of feeding is essential. The easily digested unsweetened evaporated milk with additions of calcium caseinate and starch has been found to satisfactorily fulfill these requirements.

R. N. Andrews, M.D.

ROENTGENOGRAPHIC RE-EXAMINATION OF CHESTS OF CHILDREN AFTER MEASLES.

Jerome L. Kohn, M.D., and Henry Kosransky, M.D. (Amer. Jour Dis. of Children, March, 1931). Previous report had covered roentgenograms of chest in 130 children during measles eruption. Shadows suggesting pulmonic infiltration were present in 61 per cent, before or during height of the eruption.

In re-examination in six to ten months, the investigation covered fifty-six of the above mentioned cases. Thirty-two were under 4 years and twenty-four over 4 years of age. Report included an interval history, physical examination and roentgenogram of chest.

Of the fifty-six children re-examined thirty-four had shadows of infiltration during measles eruption. Of these only eight now showed slight accentuation of the basal markings, a condition not indicative of permanent change.

"It would seem, therefore, . . . that if the child recovers from a severe case of measles, complicated by extensive pulmonary involvement, the chances of residual changes in the lungs, such as chronic fibrosis or bronchiectasis, is slight."

Pleural involvement was fairly frequent—interlobar pleuritis being noted in 26 per cent of the cases. Of these, about 53 per cent remained as interlobar shadows at the time of re-examination, and were found mostly in those that previously had pulmonic infiltration in the upper or mid lobes. Thickening of the parietal pleural commonly noted in the axillary region persisted in 16 cases to the time of re-examination.

Seventy per cent showed large homogeneous hilar shadows during eruption. The size and density of these shadows had diminished in thirty-nine of the fifty-six cases on re-examination.

In only one case of the series was an old tuberculosis aggravated by the measles infection.

The authors regard the frequency of pleural involvement to be especially worthy of comment.

J. G. Lamont, M.D.

TETANY, GENERALIZED EDEMA AND CEREBRAL COMPRESSION IN THE NEW-BORN.

W. Ray Shannon, M.D., St. Paul, Minn (Arch. of Ped., Vol. XLVIII, No. 3, March, 1931). Tetany, to be accurately understood, must be thought of primarily as a symptom-complex and not as a disease entity. Most important as a means of identifying the condition are the motor symptoms of which the widely spoken of carpopedal is the most common.

A decrease in the total calcium content of the blood is noted in all of those diseases which result in a lowering of the plasma protein level. However, in these conditions the decrease in calcium content is at the expense of the bound fraction, and tetany does not result. A decrease in the total calcium level occurs in insufficiency of the parathyroid mechanism, whether postoperative or idopathic. In this case, both the bound and the unbound fractions are decreased and tetany results, if the calcium level be sufficiently low. The idiopathic hypoparathyroid form of tetany has a definite hereditary basis. The function of calcium is that of neutralizing certain toxic substances whose poisonous effects show themselves in the absence of sufficient calcium by the signs of nervous irritability common to tetany.

The essential characteristics of the picture are spastic contractures of the upper and lower extremities, positive Chvostek's and Trousseau's phenomena, hyperactive reflexes with frequent ankle clonus, irregular clonic spasms of the facial and skeletal musculature, and increased electrical excitability.

In considering cases of infantile tetany one cannot but be struck by the fact that there is a group of three major symptom-complexes presented, namely, peripheral excitability, generalized edema, and cerebral compression.

Etiologically, it is reasonable to assume that a disturbance of the calcium metabolism is at fault, in view of the dramatic response to calcium therapy. In a case of this nature, developing in the presence of a low serum calcium, one is justified in presuming that a hypoparathyroidism is underlying, though such parathyroid deficiency must be assumed, in this as in idiopathic tetany in general, to be functional in nature. Whatever the minute mechanism may be, one is at least justified in assuming that a very delicate adjustment of chemical processes is concerned and that calcium constitutes a very important factor in that adjustment.

Tetany is to be thought of as a symptom-complex and not as a disease, due to a deficiency more qualitative than quantitative in the calcium content of the blood and tissues. It is contended that tetany is in reality of frequent occurrence in the new-born infant. Therapy consists of calcium feeding, the administration of parathyroid extract, and the use of viosterol.

It is, therefore, further contended that, standing in a causal relationship with the tetany which is of frequent occurrence in the new-born, there exist two groups of symptoms dependent also upon the deficiency in calcium, namely, general subcutaneous edema and edema of the brain, and that the three groups constitute a triad dependent primarily upon a qualitative or quantitative deficiency in the calcium metabolism of the new-born.

R. N. Andrews, M.D.

SURGERY

THE TREATMENT OF EPICONDYLITIS HUMERI (Tennis Elbow): Prof. Dr. C. Mau, of Kiel (Der Chirurg., Vol. III, No. 1, January 1, 1931, p. 5). Reviewing briefly the history of the description of this disease, as well as the possible etiological factors connected with it, the author is of the opinion that it is a circumscribed chronic periostitis of the antero-lateral surface of the external condyle of the humerus, occasionally due to a direct trauma, but in the majority of cases due to abnormally firm gripping of the hand in certain occupations, which causes a stong muscle pull of the extensor muscles attached to the condyle (supinator longus, extensor carpi radialis longus and brevis, extensor digitoris communis, extensor digitoris minimi digiti, extensor carpi ulnaris). These muscle insertions unite in a tendinous sheath or aponeurosis, which is attached to the periosteum at this point. Occasionally one gets a positive X-ray finding, showing periosteal thickening, in a view taken in a slightly oblique direction. This condition is found in occupations where a hammer is used with a twisting motion, such as in riveting, or in certain sports, such as tennis, fencing, and golfing.

While this condition is in itself not dangerous, yet it is apt to be very chronic and quite resistant to treatment, especially the usual conservative treatment, such as local applications, electric treatment, and baking. Of the conservative treatment, best results are obtained by diathermy. Massage is not only useless, but often harmful. Local injections do not give lasting benefit. Besides diathermy, the best conservative treatment consists in absolute rest of hand and elbow joints for a number of weeks, especially in a cast, holding the hand in dorsal extension with a full extension of the metacarpophalangeal joints, keeping the elbow quiet with a plaster-of-Paris cast. While beneficial in cases, yet it means inability to fill one's occupation, and also interferes with the numerous personal gestures needed in routine daily life.

It was Franke who suggested to chisel off the epicondyle, thus relieving the strain; but a better procedure, and the one which the author recommends highly, is the suggestion of Hohmann, who, at the Orthopedic Congress in Cologne in 1926, suggested nicking the tendinous insertion at the epicondyle under local anesthesia. The technic of the operation is simple. Under local anesthesia a curving incision is made over the epicondyle, and is made about 2 cm. in length. One isolates the aponeurosis of the extensor insertions, and nicks the same with a knife for a distance of 1 to 2 cm., immediately adjacent to the bone. In this way the whole extensor insertion at this point is relieved of tension. Without using deep sutures, a superficial skin suture is employed, and the arm is carried at right angled flexion at the elbow for a period of eight to ten days, using a simple splint. The hand can be left free for lighter manipulations. At the end of eight or ten days the sutures are removed, and soon routine use of the hand and elbow is begun.

There is a report of four cases given in detail, and reference is made to another twelve cases operated by Hohmann, all with excellent results. There is one illustration in this article, showing the skin incision and the exact point of nicking the tendon sheath.

A. E. Sohmer, M.D.

THERAPEUTIC PULMONARY COLLAPSE BY ALCOHOLIZATION OF PHRENIC NERVE. F. Cordrey and P. Philaredau, La Presse Medicale, February 31, 1931, Number 15, Page 271. These authors review the indications for pulmonary collapse in the treatment of certain lung conditions, and refer especially to phrenicectomy or removal of the phrenic nerve for immobilization of diaphragm. Because in certain cases it might be advisable to re-establish diaphragmatic function, some surgeons, instead of removing part of the nerve, practiced mere phrenicotomy or section of the nerve; but the re-establishment of the course of the nerve is difficult because of the location of the nerve, as well as the small size of its ends; and also because of the difficulty of exposing these ends in scar tissue and reuniting them.

In order to get complete abeyance of the phrenic nerve for a limited time, with a possibility of restoring its function, the authors have been using alcoholic injections into the nerves, similar to those that are used in trifacial neuralgia. They state that there are two possible ways of doing this—either by the closed method, or by the open method; because of the possibility of damage to the tissues, especially the pleura, they advise exposing the nerve in similar manner to that when phrenicectomy is done. One c.c. of alcohol is injected into the nerve. In a series of cases mentioned, the authors have used this method and they have found it satisfactory—thus getting immediate immobilization of the diaphragm on one or both sides, with resumption of function after a period of one to three years.

A. E. Sohmer, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

General Surgery (Practical Medicine Series). Edited by Evarts A. Graham, A.B., M.D., Professor of Surgery, Washington University School of Medicine, Saint Louis, Missouri. 848 pages. Illus. Price, $3.00. Chicago: The Year Book Publishers, 1930.

Easier Motherhood. Constance L. Todd. 199 pages. New York: The John Day Company, 1930.

The Letters of Dr. Betterman. Charles Elton Blanchard, M.D. 157 pages. Price, $1.00. Youngstown, Ohio: Medical Success Press, 1931.

Roentgen Interpretation. George W. Holmes, M.D., Roentgenologist to Massachusetts General Hospital and Assistant Professor of Roentgenology, Harvard Medical School, and Howard E. Ruggles, M.D., Roentgenologist to University of California Hospital and Clinical Professor of Roentgenology, University of California Medical School. 339 pages. Illus. Price, $5.00. Philadelphia: Lea & Febiger, 1931.

Crippled Children. Earl D. McBride, B.S., M.D., F.A.C.S., Instructor in Orthopedic Surgery, University of Oklahoma, etc. 280 pages. Illus. Price, $3.50. Saint Louis: C. V. Mosby Company, 1931.

Prenatal Care. Bureau Publication No. 4, United States Department of Labor, Children's Bureau. 71 pages. Illus. Price, 10 cents. United States Government Printing Office, Washington, 1930.

MODERN METHODS OF TREATMENT. By Logan Clendening, M.D., professor of clinical medicine, University of Kansas. Cloth. Price $10. Pp. 820. Fourth Edition. St. Louis: The C. V. Mosby Company, 1931.

This book first appeared in 1924. The second and third editions followed in 1928 and 1929. The author's clarity in describing methods of procedure, and the ready usability of the material explain much of the generous acceptance of the work; the charm of historical background and personal commentary which makes his "The Human Body" such fascinating reading are by no means absent from this volume. In his preface the author makes a remark of the type which lends a peculiar flavor to all his work: "Several mistakes (e.i. occurring in the third edition) which, as Horace Walpole said, indicated that it was the work of a gentleman rather than a mere scholar, have been corrected."

Other than a careful revision, the inclusion of certain new material chiefly distinguishes this edition from the preceding one. The author discusses these changes in his preface as follows: "I have not endeavored to add every suggested change in therapy that has developed since the last edition. My inclusions have been conditioned both by the limitations of my experience and by my judgment as to what methods are firmly established and buttressed by scientific evidence. Harington's work on the chemistry of the thyroid principle, the use of desiccated swine stomach in pernicious anemia, salyrgan, postural rest in tuberculosis as advocated by Webb, Calmette's B.C.G. tuberculin, undulant fever, ethylene and the use of parathyroid hormone in Paget's disease, and hyperparathyroidism have all been described. The sections on myxedema, diabetic coma, diet in tuberculosis, cisterna puncture, and infantile paralysis have been rewritten for this edition."

E. C. Hartley, M.D.

MODERN MEDICINE. Osler and McCrae. Third edition. Volume VI. 964 pages. Price $9.00. Philadelphia: Lea & Febiger, 1928.

Volume VI of Osler and McCrae's Modern Medicine deals with the Diseases of the Nervous System and Diseases and Abnormalities of the Mind. As a text on these subjects it is unusually complete, simply written, and very readable. With a list of twenty contributors, the names of whom would be an asset to any volume of this kind, this book gives an accurate account of the established facts as well as the most generally accepted theories and opinions in Neurology and Psychiatry.

Joel C. Hultkrans, M.D.

ANTE-NATAL CARE. W. F. T. Haultain and E. Chalmers Fahmy. 2nd edition. 127 pp. Price, $2.25. New York: William Wood & Co., 1931.

This is a concise outline of the various conditions encountered during pregnancy, together with a very brief outline of treatment and management. The first chapter describes the equipment and routine procedures of the prenatal clinic of the Royal Maternity and Simpson Memorial Hospital of Edinburgh.

Therapeutic measures are mentioned, but there is very little detail. The text probably would be more valuable to the student than to the practitioner.

L. R. Critchfield, M.D.

LABORATORY PEDIATRICS (Clinical Pediatrics, Volume XX). John D. Lyttle, A.B., M.D. Supervising Editor, Royal Storrs Haynes, Ph.B., M.D. 189 pages with contents, 31 illustrations, references and index. Price: $85.00 per set of 20 volumes and general index. Sold only in sets. New York, London: D. Appleton & Co., 1930.

The author has beautifully accomplished his purpose as expressed in the preface. There is a wealth of very fine material, tables and valuable laboratory data. One fancies a general practitioner would like, in a book so enlightening and stimulating, less of the clinical or the same amount of the clinical with more of the underlying bases of the procedures in the various laboratory tests and more complete and specific references in the bibliography. Also he would wish that still more of the methods be given.

Much food for thought and stimulus to research are embodied throughout. One feels like saying as the pages are read "whoa" and call a halt to the aeroplane view and automobile racer and to ask a pause for more detail here and there. It is just too fine a book to leave out such desired material.

The book is to be welcomed and most highly recommended, with congratulations and thanks to the author.

LILLIAN L. NYE, M.D.

COMPOSITE INDEX AND CUMULATIVE SUPPLEMENT (Clinical Pediatrics, Volume XXI). 385 pages, with contents, composite index, 5 illustrations and references. Price: $85.00 per set of 20 volumes and general index. Sold only in sets. New York, London: D. Appleton & Co., 1930.

While primarily intended for the general practitioner this volume is to be recommended to the pediatrician and obstetrician.

The Composite Index constitutes the first part of this volume and is very complete and valuable. The second part, the Cumulative Supplement, covers the development since the publication of the original manuscripts. Drs. Grulee and Bonar discuss in two sections, "The Newborn—Physiology and Care" and "The Newborn—Diseases and Abnormalities" with a bibliography; Dr. Veeder contributes "Preventive Pediatrics"; Dr. Neff, "Diseases of the Digestive System"; Drs. Lucas and Washburn, "Diseases of the Blood and Blood-Building Organs."

May the supplements continue to follow! May there be frequent revisions!

LILLIAN L. NYE, M.D.

INFANT FEEDING. J. V. C. Braithwaite. 140 pages. New York: Wm. Wood & Co., 1930.

This little volume purports to be a simplified brief discussion of infant feeding, intended for general practitioners. Its early chapters on breast feeding and the physiology of digestion are very well done; thereafter, for the American physician, at least, it leaves much to be desired. It is my impression that infant feeding, as taught in the United States, is well in advance of what this British writer portrays. Fame still awaits the pediatrician who can, readably and simply, discuss this subject in brief manner.

THOMAS MYERS, M.D.

A PRACTICAL MEDICAL DICTIONARY. Thomas Lathrop Stedman. Eleventh edition, revised. Price $7.50. New York: Wm. Wood & Company, 1930.

The eleventh edition is referred to by Stedman as "a thoroughly revised edition." In the preface, reference is made to the successful struggle to attain purification of medical orthography after two decades of patient effort. The primary function of a medical dictionary is listing definitions brief and accurate. In the reviewer's opinion, the author has attained his goal.

The source of the words are noted. Simplified spelling of medical terms is given; the older spellings are given as alternatives.

The plates of (a) autonomic nervous system, (b) surface areas related to spinal cord segments, (c) protozoan parasites, and (d) changes in the morphology of the blood are beautifully colored. Other plates, picturing, for instance, blood vessel system, nervous system, muscular systems, leave something to be desired. One wonders why this should be so. Upon reading the index of plates, the page for lymphatics is given as 1105; one must, however, turn to page 1130 to find this plate. There is no plate referring to the structures of the ear.

Beyond these few criticisms, however, one is impressed with the usefulness and the fund of material contained in this newly revised dictionary.

J. C. MICHAEL, M.D.

THE MEASUREMENT OF MAN. J. A. Harris, C. M. Jackson, D. D. Paterson, and R. E. Seammon. 215 pages, with 87 illus. Price: $2.50. Minneapolis, Univ. of Minn. pr., 1930.

This book, as the title implies, is of an academic character. The contents, first presented as lectures before the Sigma Xi society of Minnesota, are four monographs, each apportioned to some phase of human measurement. The co-authors in their respective chapters are recognized immediately as eminent scholars and teachers, all of whom at the time of writing were faculty members at the University of Minnesota.

The first chapter, The Measurement of Man in the Mass, by Dr. J. A. Harris, now deceased, and formerly head of the Department of Botany, is a concise presentation of the elements of biometrics, the application being made to the human. Formulæ are developed and appropriate explanations and illustrations are given. This chapter can be recommended for study as a valuable guide in the presentation and interpretation of the human data in the mass, which would necessarily include medical statistics.

The second chapter, Normal and Abnormal Human Types, by Dr. C. M. Jackson, head of the Department of Anatomy, is a presentation of material showing anatomical differences between races in Europe. These comparisons are then carried on into their descendants in the United States by means of data obtained from army records and student measurements at various colleges and universities, including the University of Minnesota, lending an element of fact to the sport reporters' adage, "Giants of the North." Types of bodily build are then discussed, including variations attributable to ductless gland dysfunction. The chapter closes with an interesting table relating bodily habitus to a diversity of diseases.

The third chapter, Personality and Physique, by Dr. D. G. Paterson, Professor of Psychology, begins with an observation of the general beliefs in the relationship of physical characteristics to mentality. A careful repudiation is then made of the pseudosciences of physiognomy and phrenology. This includes the records of a number of investigations undertaken in an effort to approve or disprove various assertions of the physiognomists and phrenologists.

The author then enumerates and discusses a number of investigations involving mental capacity and various physical characteristics including physical health, one of the most interesting of which compares a group of children in whom tonsillectomy and adenoidectomy have been done to a group of similar children not operated upon. No correlation was found between increased mentality and tonsillectomized children. The last named group, the children without operation, on the contrary proved to have advanced faster in mental age with interval Binet tests than the group in which operation was done. The summary embodies an apology for the negative evidence which the author has presented in the article.

The fourth chapter, the Measurement of the Body in Childhood, by Dr. R. E. Scammon, until recently Professor of Anatomy, now dean of the Department of Biology, University of Chicago, enters immediately into a presentation and discussion of growth data. Four types of postnatal growth are developed, namely—the general, the neural, the lymphoid and the genital types. The postnatal growth of certain of the ductless glands is discussed separately as it does not fit into any of the previously mentioned types. A brief discussion of the comparison of prenatal and postnatal growth is then presented. The final chapter is devoted to a discussion of what the author chooses to name "velocity of growth."

The book as a whole is very readable. While it is not a textbook in any sense, much information is presented which is of value. The book would be an addition to any library and transmits the desire to be reread at intervals.

Claude J. Ehrenberg, M.D.

PRACTICAL TREATISE ON DISEASES OF THE DIGESTIVE SYSTEM. L. Winfield Kohn, M.D., F.A.C.P. 2 vol. Price, $12.00. Philadelphia: F. A. Davis Co., 1930.

This two-volume work of 1,073 pages exclusive of the index is small enough to be very inviting and convenient, yet detailed and complete enough to be very worth while, both for general reading and as a reference book. It is profusely illustrated with 550 illustrations. Most of these are simple, well chosen, and well executed drawings. There are also a number of photographs of patients, pathologic specimens, reproductions of roentgen films and gastro-photo views, and several very fine color reproductions of gastroscopic views.

The sections on anatomy and physiology are very interestingly written without entering too deeply into involved or controversial questions. In a later chapter the neurology is most splendidly described and what is probably the most outstanding feature of the work is the Chapter on Clinico-physiological Considerations, in which the relationship between symptoms and disturbed physiology is beautifully emphasized.

The Chapter on Physical Examination brings out anew the importance of developing experience, skill and keenness of observation rather than leaving too much to accessory methods. Special emphasis is given to percussion in eliciting tenderness and to ausculation of the abdomen.

An especially interesting chapter is that in which esophagoscopy, gastroscopy and intragastric photography are discussed. Their possibilities and limitations are nicely weighed and the illustrations of technic and findings are illuminating.

Laboratory methods and interpretations of findings are given in detail.

The chapter on Fluoroscopy and Radiography is noteworthy in that it describes so well, and illustrates so impressively with silhouette drawings, the normal variations in size, shape and physiology, as well as typical variations in disease, and the technics which are helpful in disclosing the variations.

Following all these preparatory chapters the diseases of the digestive tract are taken up in order in typical textbook fashion, giving their symptoms, physical findings, laboratory and roentgen evidences, differential diagnosis, pathology, prognosis and treatment, all very interestingly and readably written. Here, in contrast to the silhouette drawings of a previous chapter, are found abundant illustrations of disease, in reproductions of X-ray films of actual cases, showing the applications of the principles taught by the more pedagogic drawings.

A section of the second volume which alone makes the whole work very much worth while is that which is devoted to diseases outside of the digestive system which cause abdominal or gastro-intestinal symptoms. This furnishes a splendid correlation and guards against too circumscribed gastro-intestinal thought.

Dr. Kohn is no therapeutic nihilist. After giving us a most splendid, though not too long, treatise on the gastro-intestinal tract, its diseases and their diagnosis, together with treatment of each one as encountered, he goes on to produce for us a wealth of therapeutic suggestions. Seventy pages are devoted to diet. The requirements for the various diseases, the properties of the various foodstuffs and their proper preparation for pathologic conditions are well described, together with many helpful diet lists for various diseases. Mechanical and all other physical therapy is generously described and evaluated, even the much questioned colonic irrigation and its technic with the arguments pro and con are well presented for our consideration. When it comes to medication an especially rich storehouse of material is laid before us. Page after page of good prescriptions are given, with the symptoms and pathology for which they are helpful. One can find here a considerable stimulus to his resourcefulness, a jog against falling into a narrow routine, against a sense of mild hopelessness if things go not too well, and against amiably prescribing the last detail man's plausible suggestion at ten or fifteen cents per capsule.

A short chapter by Zachary Cope gives the indications for and the results which may be expected of surgery. Only a suggestion of technic is given. Half of the chapter is devoted to acute surgical conditions.

Not the least of the fine features of the work is the very complete and satisfactory index which makes for quick reference to interesting symptoms, pathology or procedures.

On the whole the book is concise, very well written, and sufficiently inclusive to be a great practical help in practice.

Ralph T. Knight, M.D.

CANCER: ITS ORIGIN, ITS DEVELOPMENT AND ITS SELF-PERPETUATION. Willy Meyer, M.D., Consulting surgeon to the Lenox Hill and Postgraduate Hospitals, etc.: Emeritus Professor of Surgery, N. Y. Postgraduate Medical School. Cloth. Price, $7.50. Pp. 427. New York: Paul B. Hoeber, Inc., 1931.

The author "never intended to write" this book. His purpose was to prepare three articles on cancer. In so doing he perused a prodigious literature, and, like Adami, became "pregnant with book." He emerged from "the literature," which, like the Sargasso Sea, holds something of everything within depths, with "disconnected observations, bunched like the stars in the nebulæ of the heavens with gaping voids between the nebulæ." In order to give coherence and sequence to his material, he resorts to speculation as his only tool, and he offers the book as "an experiment, an experiment in path-finding."

To have cancer there must be a systemic predisposition. This may be hereditary on the basis of an insufficiency of the vegetative nervous system; or a similar state may be reached by strain. Once reached, this condition leads to a systemic predisposition through a predominance of potassium in the serum salts producing a chronic systemic irritation, accentuated by age. This is the constitutional factor. To produce actual cancer the second factor of local irritation must be introduced. In this manner dead tissue is left unabsorbed and acts as the local irritant; misplaced embryonic cell rests, etc., may act similarly. The combination of these two factors makes the precancerous state. There ensues a sequence of chronic cell death, necrone (cell protein decomposition products) formation, stasis, impaired cell permeability, cell proliferation and crowding. The process, as yet reversible, may continue on to definite cancer, and become irreversible. The same set of factors continue to work, so that by now the tumor is both cause and effect. The difference between carcinoma and sarcoma lies in the concentration of the necrone solution; at its highest, the epithelial tissue is dissolved, leaving nothing but a highly malignant connective tissue.

From the standpoint of therapy, he recognizes four phases: (1) the chronic systemic irritation, (2) the chronic local irritation, (3) the presence and joint activity of both factors, producing the localized operable cancer, and (4) the progress of the process to the point of generalized malignancy and metastasis, or inoperable cancer. Phase 1 becomes an obvious field for research; phase 2 is the basis of our present anti-cancer propaganda; phase 3 is the realm of surgeons and radiologists; phase 4 must be approached by changing the serum reaction from alkaline to acid—the production of a state of acidosis—and the removal of as much of the necrone-producing cancer substance as is feasible. If a successful therapeutic attack alone could be made upon a phase 4 cancer a lethal dose of necrones would be released from the decomposition of unremoved cancer tissue. The intervention of surgery is thus assured in any circumstance.

E. C. Hartley, M.D.

WANTED—Physician to share offices with dentist and physician in Lowry or New Lowry Building. If interested call Cedar 8618.

FOR SALE—Small rural hospital. All modern. Worth $25,000. Will sacrifice for $16,000. Instruments and equipment included. $5,000 cash. Balance time at 6 per cent. Address D-130, care Minnesota Medicine.

FOR SALE—Medical practice and complete office equipment in southern Minnesota town of 2,700 people of mixed nationalities. Collections excellent. Practice established 24 years. Reason for selling—death. Address D-131 case Minnesota Medicine.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

BE PREPARED to give your patient a complete examination. Why send patients away? Office space for rent in central district including two rooms and X-ray and clinical laboratory in connection. $50.00. Address D-134, care Minnesota Medicine.

FOR RENT—Desirable space on sixteenth floor Medical Arts Building, Minneapolis. Call Geneva 7685.

POSITION WANTED—As assistant in doctor's office. Graduate laboratory and X-ray technician, Swedish Hospital, Minneapolis. Business experience. Address D-133, care Minnesota Medicine.

INSTRUMENTS FOR SALE

An exceptionally complete set of surgical instruments and office equipment, property of the late Dr. Lyng, is for sale. Especially suitable for hospital. May be seen at 5145 Woodlawn Avenue, Minneapolis. Telephone Dupont 8948.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

EXAMINATION REPORT DECEMBER 2, 1930.

BY EXAMINATION

(October)

Name	School and Date of Graduation	Address
Allen, Raymond Bernard	U. of Minn., M.B. and M.D., 1928	Mayo Clinic, Rochester, Minn.
Anderson, Freedolph E.	U. of Minn., M.B., 1930	Swedish Hospital, Minneapolis, Minn.
Baker, Norman Hodgson	U. of Minn., M.B., 1928; M.D., 1929	Fergus Falls, Minn.
Berger, Edmund Henry	U. of Oregon, M.D., 1929	Mayo Clinic, Rochester, Minn.
Bohl, George Washington	U. of Minn., M.B., 1929	Ada, Minn.
Brekke, Harvey John	U. of Minn., M.B., 1930	Ancker Hospital, St. Paul, Minn.
Brick, Enoch Berrisford	U. of Minn., M.B., 1930	St. Mary's Hospital, Duluth, Minn.
Chapple, James Henry	U. of Minn., M.B., 1929; M.D., 1930	U. S. Veterans' Hospital, Sheridan, Wyo.
Cilley, Earl I. L.	U. of Mich., M.D., 1928	Mayo Clinic, Rochester, Minn.
Evans, Vernon Lawrence	Loyola Univ., M.D., 1930	Mayo Clinic, Rochester, Minn.
Feuling, John Charles	U. of Minn., M.B., 1930	St. Mary's Hospital, Duluth, Minn.
Ford, William Harold	U. of Minn., M.B., 1930	Ancker Hospital, St. Paul, Minn.
Frank, Joseph Emery	U. of Minn., M.B., 1930	3407 Pleasant Ave., Minneapolis, Minn.
Gillespie, James Bennett	U. of Iowa, M.D., 1929	Mayo Clinic, Rochester, Minn.
Gilsdorf, Walter Henry	U. of Minn., M.B., 1929	General Hospital, Minneapolis, Minn.
Imes, Pat Ryan	U. of Louisville, M.D., 1928	Mayo Clinic, Rochester, Minn.
Johnson, Victor Elias	U. of Minn., M.B., 1930	General Hospital, Minneapolis, Minn.
Jordan, Kathleen B. S.	Western Reserve Univ., M.D., 1929	Granite Falls, Minn.
Kegaries, Donald Luther	Jefferson Med. Coll., M.D., 1929	Mayo Clinic, Rochester, Minn.
Lang, Valorus Frederick	Northwestern Univ., M.B., 1929; M.D., 1930	Mayo Clinic, Rochester, Minn.
Larson, James Thelmer	U. of Minn., M.B., 1929	General Hospital, Minneapolis, Minn.
Leckband, Norbert Frederick	Rush, M.D., 1930	Buhl, Minn.
Lee, Hubert Waldemar	U. of Minn., M.B., 1929; M.D., 1930	1115 St. Olaf Ave., Northfield, Minn.
McQuiston, James Stuart	U. of Pa., M.D., 1929	102 2nd Ave. S. W., Rochester, Minn.
Mass, Max	U. of Minn., M.B., 1929; M.D., 1930	739 Iglehart Ave., St. Paul, Minn.
Miller, John Carleton	U. of Minn., M.B., 1930	1604 10th Ave. S., Minneapolis Minn.
Millet, Roscoe Frick	Northwestern Univ., M.B., 1929; M.D., 1930	Mayo Clinic, Rochester, Minn.
Myers, Frank Jay	U. of Cincinnati, M.B., 1928; M.D., 1929	Box 87, Green Springs, Ohio
Newell, Cecil Edward	U. of Virginia, M.D., 1928	Mayo Clinic, Rochester, Minn.
Oliver, Irwin Lovette	U. of Illinois, M.D., 1930	Graceville, Minn.
Overton, Lewis Marvin	U. of Maryland, M.D., 1929	Mayo Clinic, Rochester, Minn.
Owens, Clarence George	U. of Minn., M.B., 1929	General Hospital, Minneapolis, Minn.
Perlman, Everett C.	U. of Minn., M.B., 1930	St. Mary's Hospital, Minneapolis, Minn.
Pflaum, Clarence Carl	U. of Minn., M.B., 1929; M.D., 1930	1601 Main St. N. E., Minneapolis, Minn.
Pomeroy, Rex Kenneth	Indiana Univ., M.D., 1927	Mayo Clinic, Rochester, Minn.
Russ, Homer Harold	U. of Iowa, M.D., 1928	Swea City, Iowa
Rydburg, Wayne Chester	U. of Minn., M.B., 1930	Swedish Hospital, Minneapolis, Minn.
Scheldrup, Eugene Wittrup	U. of Iowa, M.D., 1929	1111 Nicollet Ave., Minneapolis, Minn.
Simons, John Brimhall	U. of Minn., M.B., 1929	Swanville, Minn.
Smith, Wyman	Northwestern Univ., M. B., 1930	328 E. Hennepin Ave., Minneapolis, Minn.
Stephenson, George W.	U. of Pa., M.D., 1928	Mayo Clinic, Rochester, Minn.
Stickney, Charlotte A.	Columbia Univ., M.D., 1928	St. Cloud, Minn.
Stuck, Walter Goodloe	Washington Univ., M.D., 1929	Mayo Clinic, Rochester, Minn.
Sukov, Marvin	U. of Minn., M.B., 1930	2500 6th St. S., Minneapolis, Minn.
Swenson, Rudolph Emil	U. of Minn., M.B., 1930	Cannon Falls, Minn.
Watson, James Rose	Harvard Univ., M.D., 1929	Mayo Clinic, Rochester, Minn.
Wilkowske, Rudolph J.	U. of Minn., M.B., 1930	Miller Hospital, St. Paul, Minn.

BY RECIPROCITY

Rixford, Emmet Lane	Stanford Univ., M.D., 1930	Mayo Clinic, Rochester, Minn.
Perrin, Stuart Henry	U. of Wis., M.D., 1928	Prior Lake, Minn.
Claydon, Howard Franklin	U. of Louisville, M.D., 1929	Zumbrota, Minn.
Fuller, Leland Stanford	Rush, M.D., 1928	Box 58, Virginia, Minn.
Olk, Howard James	St. Louis Univ., M.D., 1928	St. Paul Clinic Bldg., St. Paul, Minn.
Gully, Raymond Jacob	Creighton Univ., M.D., 1929	St. Peter, Minn.

NATIONAL BOARD CERTIFICATION

Johnson, Youbert Theodore	U. of Minn., M.B., 1928; M.D., 1929	26 W. Lake St., Minneapolis, Minn.
Kilroe, John Charles	Columbia Univ., M.D., 1926	Mayo Clinic, Rochester, Minn.
Scott, Engene Edward	U. of Mich., M.D., 1928	Hotel Lowry, St. Paul, Minn.
Selby, Keith E.	Northwestern Univ., M.D., 1930	Cook Co., Hospital, Chicago, Ill.
Younger, Lewis Irving	Northwestern Univ., M.D., 1930	61 W. 4th St., Winona, Minn.

EXAMINATION REPORT MARCH 3, 1931

BY EXAMINATION

(January)

Name	School and Date of Graduation	Address
Alderson, Lee Richard	U. of Minn., M.B., 1929; M.D., 1930	29 Sidney Place S. E., Minneapolis, Minn.
Boudry, Marshall Ovid	U. of Ill., M.D., 1930	Irwin Apts. No. 28, Rochester, Minn.
Brav, Ernest Allan	U. of Pa., M.D., 1927	512 4th St. S. W., Rochester, Minn.
Byram, James Waldamor	U. of Minn., M.B., 1930	Fairview Hospital, Minneapolis, Minn.
Cabot, Clyde Marcus	U. of Minn., M.B., 1930	University Hospital, Minneapolis, Minn.
Cabot, Hugh	Harvard, M.D., 1898	Mayo Clinic, Rochester, Minn.
Craddock, William Henry	U. of Minn., M.B., 1928; M.D., 1929	1008 1st St. S. W., Rochester, Minn.
Duryea, Willis Mortimer	U. of Minn., M.B., 1930	390 Beacon St., St. Paul, Minn.
Halpern, David Joseph	U. of Minn., M.B., 1930	University Hospital, Minneapolis, Minn.
Heazlett, William Alexander	U. of Pittsburgh, M.D., 1928	Mayo Clinic, Rochester, Minn.
Johnson, Rudolph Edwin	U. of Minn., M.B., 1930	Swedish Hospital, Minneapolis, Minn.
Jolin, Francis Milton	U. of Minn., M.B., 1930	St. Mary's Hospital, Duluth, Minn.
Kaplan, David Hyman	U. of Minn., M.B., 1930	St. Mary's Hospital, Duluth, Minn.
Koucky, Rudolph Welton	U. of Buffalo, M.D., 1929	University Hospital, Minneapolis, Minn.
Kuske, Albert W.	U. of Minn., M.B., 1930	General Hospital, Minneapolis, Minn.
Levin, Alfred G.	U. of Minn., M.B., 1929; M.D., 1930	1517 Portland Ave., St. Paul, Minn.
Loenholdt, Erich	U. of Minn., M.B., 1930	General Hospital, Minneapolis, Minn.
Macklin, William Edw., Jr.	U. of Minn., M.B., 1929; M.D., 1930	4348 Aldrich Ave. S., Minneapolis, Minn.
Marren, John Joseph	U. of Minn., M.B., 1930	General Hospital, Minneapolis, Minn.
Massey, Ben Davis	Johns Hopkins, M.D., 1928	1301 1st St., Rochester, Minn.
Mercer, Samuel Robertson	U. of Pittsburgh, M.D., 1928	Mayo Clinic, Rochester, Minn.
Meyer, Frederick Carl	U. of Minn., M.B., 1930	Miller Hospital, St. Paul, Minn.
Moss, John George	U. of Minn., M.B., 1929; M.D., 1930	Children's Hospital, Milwaukee, Wis.
Mulligan, Victor Allen	U. of Minn., M.B., 1930	St. Mary's Hospital, Duluth, Minn.
Pattee, George Lucerne	U. of Mich., M.D., 1929	Mayo Clinic, Rochester, Minn.
Rogin, James Robert	U. of Mich., M.D., 1929	718 S. W. 5th St., Rochester, Minn.
Ross, William Percival	U. of Manitoba, M.D., 1923	Southwestern Minnesota San., Worthington, Minn.
Samuelson, Leopold Gordon	U. of Minn., M.B., 1930	University Hospital, Minneapolis, Minn.
Samuelson, Samuel	U. of Minn., M.B., 1930	Swedish Hospital, Minneapolis, Minn.
Scott, Horace Golden	U. of Minn., M.B., 1928; M.D., 1929	2305 Aldrich Ave. S., Minneapolis, Minn.
Sprague, Percy Harry	U. of Alberta, M.D., 1927	Mayo Clinic, Rochester, Minn.
Waller, Lorenz McBurney	U. of Pa., M.D., 1929	Mayo Clinic, Rochester, Minn.
Wilkerson, Vernon Alex	U. of Iowa, M.D., 1925	3935 4th Ave. S., Minneapolis, Minn.
Wilkinson, Everett A.	Northwestern Univ., M.D., 1929	1301 1st St. S. W., Rochester, Minn.

BY RECIPROCITY

Gibson, James Knox	U. of Pa., M.D., 1926	217½ S. Broadway, Rochester, Minn.
Grundset, Ole J.	Coll. Med. Evangelists, Loma Linda, Cal., M.D., 1927	2429 29th Ave. S., Minneapolis, Minn.
Mills, Nathaniel	Johns Hopkins, M.D., 1912	Sivertsen Clinic, 6th St. and 24th Ave., Minneapolis, Minn.
Noble, John Franklin	U. of Pittsburgh, M.D., 1919	Ancker Hospital, St. Paul, Minn.

MINNESOTA STATE MEDICAL ASSOCIATION ROSTER 1931

OFFICERS

L. Sogge M.D.	*President*	Windom
W. H. Condit, M.D.	*First Vice President*	Minneapolis
O. W. Parker, M.D.	*Second Vice President*	Ely
E. A. Meyerding, M.D.	*Secretary*	Saint Paul
A. G. Schulze, M.D.	*Treasurer*	Saint Paul

COUNCILORS*

FIRST DISTRICT

Melvin S. Henderson, M.D. (1932)	Rochester

SECOND DISTRICT

William A. Piper, M.D. (1932)	Mountain Lake

THIRD DISTRICT

H. M. Workman, M.D. (1931)	Tracy

FOURTH DISTRICT

J. S. Holbrook, M.D. (1933)	Mankato

FIFTH DISTRICT

F. J. Savage, M.D. (1931)	Saint Paul

SIXTH DISTRICT

N. O. Pearce, M.D. (1933)	Minneapolis

SEVENTH DISTRICT

W. W. Will, M.D. (1931)	Bertha

EIGHTH DISTRICT

O. J. Hagen, M.D. (1933)	Moorhead

NINTH DISTRICT

W. A. Coventry, M.D. (1932)	Duluth

HOUSE OF DELEGATES, AMERICAN MEDICAL ASSOCIATION*

MEMBERS

H. M. Johnson, M.D. (1932)	Dawson
W. F. Braasch, M.D. (1932)	Rochester
C. B. Wright, M.D. (1931)	Minneapolis

ALTERNATES

B. S. Adams, M.D. (1932)	Hibbing
W. L. Burnap, M.D. (1932)	Fergus Falls
J. T. Christison, M.D. (1931)	Saint Paul

COMMITTEES

CHAIRMAN, PROGRAM AND GENERAL ARRANGEMENTS COMMITTEES

A. E. Hedback, M.D.	Minneapolis

SECTION ON MEDICINE

Harry Oerting, M.D.	Saint Paul
P. G. Boman, M.D.	Duluth

SECTION ON SURGERY

A. W. Adson, M.D.	Rochester
E. A. Regnier, M.D.	Minneapolis

CLINICAL DEMONSTRATIONS

W. A. O'Brien, M.D.	Minneapolis

COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

Gilbert J. Thomas, M.D.	Minneapolis
B. S. Adams, M.D.	Hibbing
G. E. Brown, M.D.	Rochester
A. J. Chesley, M.D.	Saint Paul
E. M. Hammes, M.D.	Saint Paul
J. W. Helland, M.D.	Spring Grove
F. J. Hirschboeck, M.D.	Duluth
A. G. Liedloff, M.D.	Mankato
O. E. Locken, M.D.	Crookston
E. G. McKeown, M.D.	Pipestone
W. A. O'Brien, M.D.	Minneapolis
N. O. Pearce, M.D.	Minneapolis
C. M. Robilliard, M.D.	Faribault
W. H. Valentine, M.D.	Tracy
G. B. Weiser, M.D.	New Ulm
W. W. Will, M.D.	Bertha

COMMITTEE ON PUBLIC POLICY AND LEGISLATION

H. M. Johnson, M.D.	Dawson
L. A. Barney, M.D.	Duluth
E. A. Eberlin, M.D.	Glenwood
J. M. Hayes, M.D.	Minneapolis
N. G. Mortenson, M.D.	Saint Paul
M. O. Oppegaard, M.D.	Crookston
F. J. Plondke, M.D.	Saint Paul
C. B. Wright, M.D.	Minneapolis

COMMITTEE ON PUBLIC HEALTH EDUCATION

George Earl, M.D.	Saint Paul
W. H. Aurand, M.D.	Minneapolis
H. B. Bailey, M.D.	Fairmont
R. O. Beard, M.D.	Minneapolis
B. J. Branton, M.D.	Willmar
A. G. Chadbourn, M.D.	Heron Lake
C. O. Estrem, M.D.	Fergus Falls
E. K. Geer, M.D.	Saint Paul
H. F. Helmholz, M.D.	Rochester
John A. McIntyre, M.D.	Owatonna
F. H. Magney, M.D.	Duluth
J. A. Myers, M.D.	Minneapolis
F. H. Neher, M.D.	Saint Paul
C. J. Plonske, M.D.	Faribault
Theodore Sweetser, M.D.	Minneapolis
J. A. Watson, M.D.	Minneapolis

COMMITTEE ON STATE HEALTH RELATIONS

Theodore Sweetser, M.D.	Minneapolis
F. H. Aldrich, M.D.	Belview
W. H. Barr, M.D.	Wells
E. S. Boleyn, M.D.	Stillwater
W. L. Burnap, M.D.	Fergus Falls
Harry Cannon, M.D.	Saint Paul
George Earl, M.D.	Saint Paul
Edw. T. Evans, M.D.	Minneapolis
W. P. Freligh, M.D.	Albert Lea
C. L. Haney, M.D.	Duluth
J. P. McDowell, M.D.	Saint Cloud
F. M. Manson, M.D.	Worthington
Olaf A. Olson, M.D.	Minneapolis
C. L. Scofield, M.D.	Benson
I. W. Steiner, M.D.	Winona
J. A. Thabes, Jr., M.D.	Brainerd
Nels Westby, M.D.	Madison

---

*Terms expire December 31, of year indicated.

RADIO COMMITTEE

L. R. Critchfield, M.D.	Saint Paul
Thos. H. Dickson, Jr., M.D.	Saint Paul
O. O. Larsen, M.D.	Detroit Lakes
C. B. Lewis, M.D.	Saint Cloud
T. A. Lowe, M.D.	South Saint Paul
J. J. McGroarity, M.D.	Easton
S. R. Maxeiner, M.D.	Minneapolis
A. M. Snell, M.D.	Rochester

EDITING AND PUBLISHING COMMITTEE*

A. S. Hamilton, M.D. (1935)	Minneapolis
J. T. Christison, M.D. (1934)	Saint Paul
D. C. Balfour, M.D. (1933)	Rochester
E. L. Gardner, M.D. (1932)	Minneapolis
John M. Armstrong, M.D. (1931)	Saint Paul
R. E. Farr, M.D., Emeritus	Minneapolis

SPECIAL COMMITTEES

COMMITTEE ON CONTRACT PRACTICE*

A. N. Collins, M.D. (1933)	Duluth
P. A. Smith, M.D. (1933)	Faribault
Willard D. White, M.D. (1933)	Minneapolis
G. I. Badeaux, M.D. (1932)	Brainerd
R. E. Hultkrans, M.D. (1932)	Minneapolis
A. L. McDonald, M.D. (1932)	Duluth
A. R. Colvin, M.D. (1931)	Saint Paul
C. N. McCloud, M.D. (1931)	Saint Paul
R. C. Webb, M.D. (1931)	Minneapolis

COMMITTEE ON MEDICO-LEGAL AFFAIRS

W. H. Hengstler, M.D.	Saint Paul
H. E. Bowers, M.D.	Lake City
H. B. Hannah, M.D.	Minneapolis
B. O. Mork, M.D.	Worthington
C. P. Robbins, M.D.	Winona

COMMITTEE ON UNIVERSITY RELATIONS

L. Sogge, M.D.	Windom
S. H. Boyer, M.D.	Duluth
W. F. Braasch, M.D.	Rochester
J. T. Christison, M.D.	Saint Paul
H. M. Workman, M.D.	Tracy
C. B. Wright, M.D.	Minneapolis

HEART COMMITTEE

H. E. Richardson, M.D.	Saint Paul
F. J. Hirschboeck, M.D.	Duluth
Douglas P. Head, M.D.	Minneapolis
B. W. Kelly, M.D.	Aitkin
H. J. Lloyd, M.D.	Mankato
F. A. Willius, M.D.	Rochester

COMMITTEE ON MILITARY AFFAIRS

Lieut. Col. Ralph T. Knight	Minneapolis
Major Martin Aune	Minneapolis
Major W. J. Eklund	Duluth
Major L. J. Holmberg	Canby
Major F. L. Smith	Rochester
Lieut. Col. W. G. Workman	Tracy

HISTORICAL COMMITTEE

A. S. Hamilton, M.D.	Minneapolis
J. M. Armstrong, M.D.	Saint Paul
W. F. Braasch, M.D.	Rochester
L. O. Dart, M.D.	Minneapolis
J. F. Fulton, M.D.	Saint Paul
Olga Hansen, M.D.	Minneapolis
C. A. Scherer, M.D.	Duluth
H. M. Workman, M.D.	Tracy

COMMITTEE ON PUBLIC HEALTH NURSING

C. B. Wright, M.D.	Minneapolis
C. E. Caine, M.D.	Morris
George Earl, M.D.	Saint Paul
T. E. Flinn, M.D.	Redwood Falls

COMMITTEE ON SCHOOLS FOR LABORATORY TECHNICIANS

A. G. Schulze, M.D.	Saint Paul
W. H. Condit, M.D.	Minneapolis
Arthur U. Desjardins, M.D.	Rochester
Charles R. Drake, M.D.	Minneapolis
Kano Ikeda, M.D.	Saint Paul
W. A. O'Brien, M.D.	Minneapolis
Leo Rigler, M.D.	Minneapolis

COMMITTEE TO STUDY POLICIES OF THE STATE ASSOCIATION

O. E. Locken, M.D.	Crookston
F. E. Burch, M.D.	Saint Paul
W. A. Fansler, M.D.	Minneapolis
J. R. Manley, M.D.	Duluth
Waltman Walters, M.D.	Rochester

COUNCILOR DISTRICTS

DISTRICT NO. 1

M. S. Henderson, M.D. .... Rochester

Counties—Dodge, Fillmore, Freeborn, Houston, Mower, Olmsted, Steele, Wabasha, Waseca, Winona.

DISTRICT NO. 2

Wm. A. Piper, M.D. .... Mountain Lake

Counties—Cottonwood, Faribault, Jackson, Martin, Murray, Nobles, Pipestone, Rock, Watonwan.

DISTRICT NO. 3

H. M. Workman, M.D. .... Tracy

Counties—Brown, Big Stone, Chippewa, Lac Qui Parle, Lincoln, Lyon, Pope, Redwood, Stevens, Swift, Yellow Medicine

DISTRICT NO. 4

J. S. Holbrook, M.D. .... Mankato

Counties—Blue Earth, Carver, LeSueur, McLeod, Nicollet, Renville, Scott, Sibley.

DISTRICT NO. 5

F. J. Savage, M.D. .... Saint Paul

Counties—Chisago, Anoka, Dakota, Goodhue, Isanti, Ramsey, Rice, Washington.

DISTRICT NO. 6

N. O. Pearce, M.D. .... Minneapolis

Counties—Hennepin, Kandiyohi, Meeker, Sherburne, Stearns, Wright.

DISTRICT NO. 7

W. W. Will, M.D. .... Bertha

Counties—Beltrami, Benton, Cass, Clearwater, Crow Wing, Douglas, Hubbard, Mille Lacs, Morrison, Todd, Wadena.

DISTRICT NO. 8

O. J. Hagen, M.D. .... Moorhead

Counties—Becker, Clay, Grant, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Ottertail, Pennington, Polk, Red Lake, Roseau, Traverse, Wilkin.

DISTRICT NO. 9

W. A. Coventry, M.D. .... Duluth

Counties—Aitkin, Carlton, Cook, Itasca, Kanabec, Koochiching, Lake, Pine, St. Louis.

---

*Term expires December 31, of year indicated.

Minnesota State Medical Association

COUNTY SOCIETY ROSTER

BLUE EARTH COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of month.
Annual meetings, last Monday of year.

President
Stillwell, W. C.....Mankato

Secretary
Butzer, J. A.....Mankato

Andrews, J. W.	Mankato
Andrews, R. N.	Mankato
Barr, W. H.	Wells
Benham, E. W.	Mankato
Black, Wm.	Mankato
Butzer, J. A.	Mankato
Cosgriff, J. A.	Olivia
Dahl, G. A.	Mankato
Denman, A. V.	Mankato
Eckstein, A. W.	Mankato
Edwards, R. T.	Elysian
Franchere, F. W.	Lake Crystal
Fugina, G. R.	Mankato
Hassett, R. G.	Mankato
Hielscher, Helen Hughes	Mankato
Hielscher, J. A.	Mankato
Holbrook, J. S.	Mankato
Howard, M. I.	Mankato
Huffington, H. L.	Mankato
Juliar, R. O.	St. Clair
Kemp, A. F.	Mankato
Koenigsberger, Chas.	Mankato
Liedloff, A. G.	Mankato
Lloyd, H. J.	Mankato
Macbeth, J. L.	St. Clair
Miller, V. I.	Mankato
Osborn, Lida	Mankato
Schlesselman, J. T.	Mankato
Schmidt, P. A.	Good Thunder
Sohmer, A. E.	Mankato
Stillwell, W. C.	Mankato
Wentworth, A. J.	Mankato
Williams, H. O.	Lake Crystal

BLUE EARTH VALLEY MEDICAL SOCIETY

Faribault and Martin Counties,
Regular meetings, May-October.
Annual meeting, October.

President
Mills, J. L.....Winnebago

Secretary
Hunt, R. C.....Fairmont

Bailey, H. B.	Fairmont
Blanchard, H. G.	Fairmont
Boysen, H.	Welcome
Butz, J. A.	Monterey
Chambers, W. C.	Blue Earth
Cooper, M. D.	Winnebago
Durgin, F. L.	Winnebago
Farrish, R. C.	Sherburn
Gardner, V. H.	Fairmont
Heimark, J. J.	Fairmont
Henderson, A. J.	Kiester
Hunt, F. N.	Fairmont
Hunt, R. C.	Fairmont
Hunte, A. F.	Bylos, Arizona
Jacobs, A. C.	Elmore
Johnson, H. P.	Fairmont
Logan, F. W.	Blue Earth
Luedtke, G. H.	Fairmont
McGroarity, J. J.	Easton
Miller, H. A.	Fairmont
Mills, J. L.	Winnebago
Richardson, W. J.	Fairmont
Sommer, A. W.	Elmore
Sybilrud, H. W.	Bricelyn
Vaughan, V. M.	Truman
Zemke, E. E.	Fairmont

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle, Sibley, Renville, and Yellow Medicine Counties
Regular meetings, April and July.
Annual meeting, October.

President
Passer, A. A.....Olivia

Secretary
Holmberg, L. J.....Canby

Adams, R. C.	Bird Island
Aldrich, F. H.	Belview
Bacon, R. S.	Montevideo
Bergh, L. N.	Montevideo
Billings, R. E.	Franklin
Brand, W. A.	Redwood Falls
Burns, M. A.	Milan
Cole, H. B.	Redwood Falls
Cress, E. E.	Boyd
D'Arms, Harry Lee	Hector
Dordal, J.	Sacred Heart
Duncan, Henry	Marietta
Fawcett, A. Maxwell	Renville
Flinn, B. P.*	Redwood Falls
Flinn, T. E.	Redwood Falls
Flower, W. Z.	Minneapolis
Foshager, Henry T.	Clara City
Gaines, E. C.	Buffalo Lake
Hauge, Malvin I.	Clarkfield
Hauge, M. M.	Clarkfield
Herbert, Willis Lea	Maynard
Holmberg, L. J.	Canby
Johnson, C. M.	Dawson
Johnson, H. M.	Dawson
Johnson, O. H.	Echo
Jordan, Lewis S.	Granite Falls
Kilbride, J. S.	Canby
Lee, Walter N.	Madison
Lima, Ludvig	Montevideo
Mesker, G. H.	Olivia
Nelson, M. S.	Granite Falls
Olson, W. P.	Gaylord
Passer, A. A.	Olivia
Paul, L. W.	Madison, Wis.
Penhall, F. W.	Morton
Roust, H. A.	Montevideo
Smith, L. G.	Montevideo
Stemsrud, A. A.	Dawson
Tangen, Geo. M.	Canby
Westby, Magnus	Madison
Westby, Nels	Madison

CENTRAL MINNESOTA DISTRICT MEDICAL SOCIETY

Anoka, Isanti, Kanabec, Mille Lacs and Sherburne Counties.
Regular meetings, May and October.
Annual meeting, January.

President
Swenson, Chas.....Braham

Secretary
Cooney, H. C.....Princeton

Cooney, H. C.	Princeton
Hedenstrom, L. H.	Cambridge
Holm, C. E.	Philadelphia, Pa.
Kooiker, Herman J.	Milaca
Norrgard, H. T.	Milaca
Peterson, A. A.	Mora
Roadman, I. M.	Ponsford
Roehlke, A. B.	Elk River
Swennes, O. S.	Wahkon
Swenson, Chas.	Braham
Vik, M.	Onamia
Vrooman, F. E.	St. Francis

CHISAGO-PINE COUNTY MEDICAL SOCIETY

Regular meetings, January, August and December.
Annual meeting, May.

President
Callahan, F. F.....Pokegama
Secretary
Schoofs, G. E.....North Branch
Callahan, F. F.....Pokegama

Dredge, H. P.	Sandstone
Flom, A. O.	Chisago City
Halpin, J. E.	Rush City
Holmes, Alva E.	Rush City
Kelsey, C. G.	Hinckley
Nethercott, E. G.	Pine City
Pearson, Wm. T.	Finlayson
Schoofs, G. E.	North Branch
Stephan, E. L.	Hinckley
Stratte, A. K.	Pine City
Truog, Clarence P.	Lindstrom
Zeien, Thos.	North Branch

---

*Deceased.

CLAY-BECKER COUNTY MEDICAL SOCIETY

Regular meetings, January, April, July and October.
Annual meeting, December.

President	
Bottolfson, B. T.	Moorhead
Secretary	
Heimark, J. H.	Moorhead
Aborn, W. H.	Hawley
Archibald, F. M.	Mahnomen
Bergheim, M. C.	Hawley
Bottolfson, B. T.	Moorhead
Carmen, J. E.	Detroit Lakes
Ellingson, A. R.	Detroit Lakes
Gosslee, G. L.	Moorhead
Gunderson, R. M.	Lake Park
Hagen, O. J.	Moorhead
Heimark, J. H.	Moorhead
Humphrey, E. W.	Moorhead
Larsen, O. O.	Detroit Lakes
Larson, Arnold	Detroit Lakes
Meighen, J. W.	Ulen
Rutledge, L. H.	Detroit Lakes
Scott, R. A.	Detroit Lakes
Simison, C. W.	Hawley
Soine, T. S.	Barnesville
Thornby, H. J.	Moorhead
Thysell, F. A.	Moorhead

DODGE COUNTY MEDICAL SOCIETY

Annual meeting, September.

President	
Baker, H. R.	Hayfield
Secretary	
Bigelow, C. E.	Dodge Center
Adams, Rollin T.	Mantorville
Affeldt, Daniel E.	Kasson
Baker, Harry R.	Hayfield
Bigelow, Charles E.	Dodge Center
Clifford, Frank F.	West Concord
Smith, Frank D.	Kasson

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, December.

President	
Palmer, W. L.	Albert Lea
Secretary	
Freligh, W. P.	Albert Lea
Branham, D. S.	Albert Lea
Burns, H. D.	Albert Lea
Butturff, C. R.	Freeborn
Calhoun, F. W.	Albert Lea
Folken, F. G.	Albert Lea
Freeman, J. P.	Albert Lea
Freligh, W. P.	Albert Lea
Gamble, J. W.	Albert Lea
Gamble, P. M.	Albert Lea
Gamble, R. M.	Albert Lea
Gullixson, A.	Albert Lea
Kaasa, L. J.	Albert Lea
Kamp, B. A.	Albert Lea
Manley, L. V.	Albert Lea
Palmer, C. F.	Albert Lea
Palmer, W. L.	Albert Lea
Schultz, J. A.	Albert Lea
Whitson, S. A.	Alden

GOODHUE COUNTY MEDICAL SOCIETY

Annual meeting, January.

President	
Claydon, D. R.	Red Wing
Secretary	
Steffens, L. A.	Red Wing
Aanes, A. M.	Red Wing
Anderson, S. H.	Red Wing
Claydon, D. R.	Red Wing
Claydon, Howard F.	Zumbrota
Claydon, L. E.	Red Wing
Cremer, M. H.	Red Wing
Fortney, G. O.	Zumbrota
Johnson, A. E.	Red Wing
Jones, A. W.	Red Wing
Liffrig, W. W.	Goodhue
McGuigan, H. T.	Red Wing
Smith, M. W.	Red Wing
Steffens, L. A.	Red Wing
Vaaler, T.	Cannon Falls
Williams, M. R.	Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday of each month.
Annual meeting, first Monday in October.

President	
Baxter, S. H.	Minneapolis
Secretary	
Hansen, Erling W.	Minneapolis
Ahrens, R. S.	Minneapolis
Aling, C. P.	Minneapolis
Allen, H. W.	Minneapolis
Allison, R. G.	Minneapolis
Altnow, H. O.	Minneapolis
Andersen, Arnt G.	Minneapolis
Anderson, Arnold S.	St. Paul
Anderson, David D.	Minneapolis
Anderson, Edw. D.	Minneapolis
Anderson, Ernest R.	Minneapolis
Anderson, Frank J.	Minneapolis
Anderson, J. K.	Minneapolis
Anderson, Karl W.	Minneapolis
Anderson, Silas C.	Minneapolis
Andreassen, E. C.	Minneapolis
Andrews, R. S.	Minneapolis
Annis, H. B.	Minneapolis
Arey, H. C.	Excelsior
Arvidson, C. G.	Minneapolis
Aune, Martin	Minneapolis
Aurand, W. H.	Minneapolis
Avery, J. Fowler	Minneapolis
Baken, Melvin P.	Minneapolis
Baker, A. T.	Minneapolis
Baker, E. L.	Minneapolis
Baker, Looe	Minneapolis
Bakke, O. H.	Minneapolis
Bank, Harry E.	Minneapolis
Barber, J. P.	Minneapolis
Barron, Moses	Minneapolis
Bass, G. W.	Minneapolis
Baxter, S. H.	Minneapolis
Beard, Archie H.	Minneapolis
Beard, R. O.	Minneapolis
Bedford, Edgar W.	Minneapolis
Bell, E. T.	Minneapolis
Bell, J. W.	Minneapolis
Benedict, E. E.	Minneapolis
Benjamin, A. E.	Minneapolis
Benn, F. G.	Minneapolis
Berkwitz, Nathan Jos.	Minneapolis
Bessesen, A. N., Sr.	Minneapolis
Bessesen, A. N., Jr.	Minneapolis
Bessesen, Daniel H.	Minneapolis
Blake, James	Hopkins
Blaustone, H. H.	Minneapolis
Bockman, M. W. H.	Minneapolis
Boe, A. M.	Minneapolis
Boies, Lawrence R.	Minneapolis
Booth, A. E.	Minneapolis
Boquist, E. T. W.	Minneapolis
Boreen, Clifton A.	Minneapolis
Borgeson, E. J.	Minneapolis
Bouman, H. A.	Minneapolis
Boynton, Ruth E.	Minneapolis
Bracken, H. M.	Claremont, Calif.
Bratrud, A. F.	Minneapolis
Brooks, Chas. N.	Minneapolis
Brown, Edgar D.	Minneapolis
Brown, E. J.	Minneapolis
Bulkley, Kenneth	Minneapolis
Butler, John	Minneapolis
Buzzelle, L. K.	Minneapolis
Cable, Morris L.	Minneapolis
Cabot, G. S.	Minneapolis
Cabot, V. S.	Minneapolis
Cady, L. H.	Minneapolis
Callerstrom, G. W.	Minneapolis
Cameron, Isabell L.	Minneapolis
Camp, Walter E.	Minneapolis
Campbell, L. M.	Minneapolis
Campbell, Orwood J.	Minneapolis
Campbell, Robert A.	Minneapolis
Cardle, A. E.	Minneapolis
Carey, James B.	Minneapolis
Carlaw, C. M.	Minneapolis
Caron, Robt. P.	Minneapolis
Cavanor, F. T.	Minneapolis
Chamberlain, H. E.	Minneapolis
Cheleen, S. J.	Minneapolis
Cherry, Chas. H.	Minneapolis
Chesley, A. J.	Minneapolis
Clark, Howard S.	Minneapolis
Cohen, Sumner S.	Oak Terrace
Condit, W. H.	Minneapolis
Cook, Henry W.	Minneapolis
Corbett, J. Frank	Minneapolis
Corniea, A. D.	Minneapolis
Cosman, E. O.	Minneapolis
Crafts, Leo M.	Minneapolis
Cranmer, Richard R.	Minneapolis
Cranston, Robert	St. Louis Park
Creighton, Ralph H.	Minneapolis
Crume, Geo. P.	Minneapolis
Curtin, John F.	Minneapolis
Cutts, George	Minneapolis
Dady, Elmer E.	Minneapolis
Dahl, Elmer O.	Minneapolis
Dahl, John A.	Minneapolis
Dahlstrom, A. W.	Minneapolis
Daniel, Donald H.	Minneapolis
Daniel, L. M.	Minneapolis
Dart, L. O.	Minneapolis
Devereaux, T. J.	Wayzata
Dewar, J. E.	Minneapolis
Deziel, G.	Minneapolis
Diehl, Harold S.	Minneapolis
Diessner, H. D.	Minneapolis
Doering, R. E.	Minneapolis
Donaldson, C. A.	Mesa, Ariz.
Dorge, Richard	Minneapolis
Dornblaser, H. Bright	Minneapolis
Dorsey, Geo. C.	Minneapolis
Doxey, G. L.	Minneapolis
Doyle, L. O.	Minneapolis
Drake, C. R.	Minneapolis
Dreisbach, N.	Minneapolis
Duff, Edwin R.	Minneapolis
Dunlap, E. H.	Minneapolis
Dunn, Geo. Robert	Minneapolis
Duryea, Marbry	Minneapolis
Dutton, C. E.	Minneapolis
Dworsky, S. D.	Minneapolis
Egilsrud, Kristian	Minneapolis
Ehrenberg, C. J.	Minneapolis
Ehrlich, S. Paul	Minneapolis
Eisenstadt, D. H.	Minneapolis
Eitel, George D.	Minneapolis
Ellison, David E.	Minneapolis
Emond, Albert J.	Minneapolis
Erb, F. A.	Minneapolis
Erdman, C. A.	Minneapolis

Erickson, R. F.	Minneapolis
Ericson, J. G.	Minneapolis
Ericson, Reinhold	Minneapolis
Evans, Edward T.	Minneapolis
Evans, R. D.	Minneapolis
Everlof, J. L.	Minneapolis
Exley, E. W. F.	Minneapolis
Fahr, George	Minneapolis
Fansler, W. A.	Minneapolis
Farabaugh, Chas	Minneapolis
Farr, R. E.	Minneapolis
Fenger, E.	Oak Terrace
Fink, Leo W.	Minneapolis
Fink, Walter H.	Minneapolis
Fitzgerald, D. F.	Minneapolis
Fjeldstad, C. A.	Minneapolis
Fjellman, R. C.	Minneapolis
Flagstad, A. E.	Minneapolis
Fleming, A. S.	Minneapolis
Fowler, L. Haynes	Minneapolis
Fox, John M.	Minneapolis
Fredericks, Geo. M.	Minneapolis
Friedell, A.	Minneapolis
Funk, Victor K.	Oak Terrace
Gardner, E. L.	Minneapolis
Geist, Emil S.	Minneapolis
Giere, Eric O.	Minneapolis
Giere, J. C.	Minneapolis
Giere, Richard W.	Minneapolis
Giessler, Paul W.	Minneapolis
Gilles, F. L.	Minneapolis
Gingold, Benj. A.	Minneapolis
Girvin, Richard B.	Minneapolis
Gordon, G. J.	Minneapolis
Gratzek, Frank R.	Minneapolis
Green, E. K.	Minneapolis
Greene, Willard P.	Minneapolis
Greisheimer, Esther M.	Minneapolis
Grimes, Marian	Minneapolis
Gronvall, Paul R.	Minneapolis
Gunderson, Nels A.	Minneapolis
Gustafson, H. T.	Minneapolis
Hacking, Frank H.	Minneapolis
Haddow, N. W.	Minneapolis
Hagen, G. L.	Minneapolis
Haggard, G. D.	Minneapolis
Hall, J. M.	Minneapolis
Hall, S. S.	Minneapolis
Hallberg, C. A.	Minneapolis
Hamilton, Arthur S.	Minneapolis
Hamlin, Geo. B.	Minneapolis
Hammond, A. J.	Minneapolis
Hannah, Hewitt B.	Minneapolis
Hansen, Erling W.	Minneapolis
Hansen, Olga	Minneapolis
Hanson, H. J.	Minneapolis
Hanson, Henry V.	Minneapolis
Hare, E. R	Minneapolis
Harrington, C. D.	Minneapolis
Harrington, F. E.	Minneapolis
Hartzell, Thomas B.	Minneapolis
Hastings, D. R.	Minneapolis
Haverfield, Addie R.	Minneapolis
Hawkinson, Raymond P.	Minneapolis
Hayes, James M.	Minneapolis
Head, Douglas P.	Minneapolis
Head, G. D.	Minneapolis
Hearn, Wm. O.	Minneapolis
Hedback, A. E.	Minneapolis
Hedding, J. A.	Minneapolis
Heim, Russell R.	Minneapolis
Helk, H. H.	Minneapolis
Hendrickson, J. F.	Minneapolis
Henry, C. E.	Minneapolis
Henry, Myron O.	Minneapolis
Herbolsheimer, A. J.	Minneapolis
Herbst, Wm. P.	Minneapolis
Herman, Arthur L.	Minneapolis
Hiebert, J. P.	Minneapolis
Higbee, Paul A.	Minneapolis
Higgins, J. H.	Minneapolis
Hilbert, Eunice	Minneapolis
Hill, Eleanor J.	Minneapolis
Hirschfelder, A. D.	Minneapolis
Hirschfield, Adolph	Minneapolis
Hirshfield, F. R.	Minneapolis
Hoaglund, A. W.	Minneapolis
Hobbs, C. A.	Minneapolis
Hodge, S. V.	Minneapolis
Hoiland, A. S.	Minneapolis
Holen, T.	Minneapolis
Holl, P. M.	Minneapolis
Holt, Wm. B.	Minneapolis
Howard, Wm. H.	Minneapolis
Huenekens, E. J.	Minneapolis
Hughes, L. D.	Minneapolis
Hultkrans, Rudolph E.	Minneapolis
Hurd, Annah	Minneapolis
Hutchinson, Chas. J.	Minneapolis
Hymes, Chas.	Minneapolis
Hynes, James	Minneapolis
Hynes, John E.	Minneapolis
Irwin, A. F.	Minneapolis
Jackson, C. M.	Minneapolis
Jennings, Frank L.	Oak Terrace
Jennings, Mary H.	Minneapolis
Jensen, Harry	Minneapolis
Jensen, Louis	Minneapolis
Jensen, M. J.	Minneapolis
Johnson, A. E.	Minneapolis
Johnson, James A.	Minneapolis
Johnson, Julius	Minneapolis
Johnson, Nimrod	Minneapolis
Johnson, Norman P.	Minneapolis
Johnson, R. A.	Minneapolis
Johnson, S. M.	Minneapolis
Jones, G. M.	Minneapolis
Jones, H. W.	Minneapolis
Jones, Wm. R.	Minneapolis
Kelby, G. M.	Minneapolis
Kennedy, C. C.	Minneapolis
Kennedy, Jane F.	Minneapolis
Kennedy, R. Roy	Minneapolis
Kibbe, O. A.	Minneapolis
King, H. T.	Minneapolis
Kinsella, Thos. J.	Oak Terrace
Kistler, A. J.	Minneapolis
Kistler, C. M.	Minneapolis
Knight, Ralph T.	Minneapolis
Knight, Ray R.	Minneapolis
Koch, John C.	Minneapolis
Koepcke, G. M.	Minneapolis
Kohler, G. A.	Minneapolis
Koller, Herman M.	Minneapolis
Koller, L. R.	Minneapolis
Kremer, Walter J.	Minneapolis
Kriedt, Daniel	Minneapolis
Kucera, Frank	Hopkins
Kucera, Wm. J.	Minneapolis
Lajoie, John M.	Minneapolis
Lapierre, Arthur P.	Minneapolis
Lapierre, J. T.	Minneapolis
Larson, Clarence M.	Minneapolis
Laurent, A. A.	Minneapolis
LaVake, R. T.	Minneapolis
Lazar, H. L.	Minneapolis
Leavitt, H. H.	Minneapolis
Lebowski, Jos. A.	Minneapolis
Lee, Henry M.	Minneapolis
Lee, T. G.	Minneapolis
Leggett, Elizabeth A.	Minneapolis
Leland, Harold R.	Minneapolis
Leland, M. N.	Minneapolis
Leonard, L. J.	Minneapolis
Levine, N. M.	Minneapolis
Lillehei, E. J.	Minneapolis
Lind, C. J.	Minneapolis
Lindquist, Richard H.	Minneapolis
Linner, H. P.	Minneapolis
Linton, Wm. B.	Minneapolis
Litzenberg, J. C.	Minneapolis
Logefeil, Rudolph C.	Minneapolis
Long, Jesse	Minneapolis
Loomis, E. A.	Minneapolis
Lundgren, A. C.	Minneapolis
Lundquist, E. F.	Minneapolis
Lynch, M. J.	Minneapolis
Lyon, E. P.	Minneapolis
Lyon, J. D.	Minneapolis
Lysne, Henry	Minneapolis
McCarthy, Donald	Minneapolis
McCartney, James S.	Minneapolis
McDaniel, Orianna	Minneapolis
McEachran, A.	Minneapolis
McFarland, Arthur H.	Minneapolis
McGandy, R. F.	Minneapolis
McGeary, Geo. E.	Minneapolis
McInerny, Maurice	Minneapolis
McIntyre, George	Minneapolis
McKinlay, C. A.	Minneapolis
McKinley, J. C.	Minneapolis
McKinney, F. S.	Minneapolis
McPheeters, H. O.	Minneapolis
MacDonald, A. E.	Minneapolis
MacDonald, D. A.	Minneapolis
MacDonald, Irving C.	Minneapolis
Mach, Frank B.	Minneapolis
Macnie, J. S.	Minneapolis
Magiera, Estelle A.	Minneapolis
Maland, C. O.	Minneapolis
Mann, A. T.	Minneapolis
Mariette, Ernest	Oak Terrace
Mark, D. B.	Minneapolis
Martinson, C. J.	Wayzata
Matchan, G. R.	Minneapolis
Matthews, Justus	Minneapolis
Mattill, P. M.	Oak Terrace
Maxeiner, S. R.	Minneapolis
May, W. H.	Minneapolis
Merkert, Chas. E.	Minneapolis
Merkert, G. L.	Minneapolis
Michael, J. C.	Minneapolis
Michelson, H. E.	Minneapolis
Milton, J. S.	Minneapolis
Moen, J. K., Jr.	Minneapolis
Moir, Wm. W.	Minneapolis
Moorhead, Martha B.	Minneapolis
Moren, E.	Minneapolis
Moriarity, Cecile	Minneapolis
Morrison, Angus W.	Minneapolis
Moyers, J. Arthur	Minneapolis
Murphy, I. J.	Minneapolis
Nathanson, M. H.	Minneapolis
Nelson, C. P.	Minneapolis
Nelson, Harvey	Minneapolis
Nelson, H. S.	Minneapolis
Nelson, O. E.	Minneapolis
Newhart, Horace	Minneapolis
Noran, A. N.	Minneapolis
Nordin, G. T.	Minneapolis
Nordland, Martin	Minneapolis
Noth, H. W.	Minneapolis
Nystrom, Ruth G.	Minneapolis
Oberg, C. M.	Minneapolis
O'Brien, Wm. A.	Minneapolis
O'Donnell, J. E.	Minneapolis
Olson, F. A.	Minneapolis
Olson, Olaf A.	Minneapolis
Olson, R. G.	Minneapolis
Owre, Oscar	Minneapolis
Parks, Albert H.	Minneapolis
Patterson, W. E.	Minneapolis
Paulsen, E. L.	Minneapolis
Pearce, N. O.	Minneapolis
Pederson, Harold	Minneapolis
Pederson, R. M.	Minneapolis
Peppard, T. A.	Minneapolis
Perley, Arthur E.	Minneapolis
Peters, R. M.	Minneapolis
Peterson, Herbert W.	Minneapolis
Peterson, J. R.	Minneapolis
Peterson, O. H.	Minneapolis
Peterson, P. E.	Minneapolis
Peterson, Thorvald	Minneapolis
Peterson, Willard C.	Minneapolis
Petit, L. J.	Minneapolis
Pettit, C. W.	Minneapolis
Pfunder, M. C.	Minneapolis
Phelps, Kenneth A.	Minneapolis
Platou, Erling S.	Minneapolis
Pollard, D. W.	Minneapolis
Pollock, D. K.	Minneapolis
Polzak, J. A.	Minneapolis
Poppe, Fred H.	Minneapolis
Porter, Oliver M.	Minneapolis
Potter, Edith L.	Minneapolis
Pratt, Fred J.	Minneapolis
Pratt, J. A.	Minneapolis
Preine, Irving A.	Minneapolis
Prim, J. A.	Minneapolis
Proshek, Chas. E.	Minneapolis
Quinby, Thos. F.	Minneapolis
Quist, H. W.	Minneapolis
Reed, Chas. A.	Minneapolis
Rees, Soren P.	Minneapolis
Regnier, E. A.	Minneapolis
Reynolds, J. S.	Minneapolis
Richardson, Fred S.	Minneapolis
Richdorf, L. F.	Minneapolis
Rishmiller, J. H.	Minneapolis
Ridgway, Florence M.	Minneapolis
Rigler, Leo G.	Minneapolis
Rizer, R. I.	Minneapolis
Roan, Carl M.	Minneapolis
Robb, Edwin F.	Minneapolis
Roberts, Thos. S.	Minneapolis
Roberts, W. B.	Minneapolis
Robitshek, E. C.	Minneapolis
Rochford, W. E.	Minneapolis
Rodda, F. C.	Minneapolis
Rodgers, C. L.	Minneapolis
Rosen, S.	Minneapolis
Rosenberg, Maurice N.	Minneapolis
Rosenwald, R. M.	Minneapolis
Rucker, Chas. W.	Minneapolis
Rucker, Wm. H.	Minneapolis
Rudell, Gustave L.	Minneapolis
Sadler, Wm. P.	Minneapolis
Salt, C. G.	Minneapolis
Sawatzky, Wm. A.	Minneapolis
Schaaf, Frederick H. K.	Minneapolis
Schaefer, W. G.	Minneapolis
Scheldrup, N. H.	Minneapolis
Schlesselman, Geo. H.	Anoka
Schmidt, G. F.	Minneapolis
Schmitt, A. F.	Minneapolis
Schwartz, Virgil J.	Minneapolis
Schwyzer, G.	Minneapolis
Schwyzer, Robt	Minneapolis
Scott, F. H.	Minneapolis
Seaberg, J. A.	Minneapolis
Seashore, Gilbert	Minneapolis
Seham, Max	Minneapolis
Selleseth, Ivar F.	Minneapolis
Sessions, J. C.	Minneapolis
Simons, Jalmar	Minneapolis
Simpson, E. D.	Minneapolis
Simpson, John D.	Minneapolis

Siperstein, D. M	Minneapolis
Sitar, Richard F	Minneapolis
Sivertsen, Ivar	Minneapolis
Slocumb, Maude	Minneapolis
Smith, Adam M	Minneapolis
Smith, Arthur E	Minneapolis
Smith, Homer R	Minneapolis
Smith, Norman M	Minneapolis
Soderlind, A.*	Minneapolis
Soderlind, Ragnar T	Minneapolis
Solhaug, S. B	Minneapolis
Spratt, C. N	Minneapolis
Stelter, Lloyd A	Minneapolis
Stenstrom, A. T	Minneapolis
Stewart, C. A	Minneapolis
Stewart, R. I	Minneapolis
Strachauer, Arthur C	Minneapolis
Strout, E. S	Minneapolis
Strout, G. Elmer	Minneapolis
Sturre, J. R	Minneapolis
Sullivan, Raymond	Minneapolis
Sundt, Mathias	Minneapolis
Swanson, Cephas	Minneapolis
Swanson, Roy E	Minneapolis
Sweetser, H. B., Jr	Minneapolis
Sweetser, H. B., Sr	Minneapolis
Sweetser, Theo	Minneapolis
Sweitzer, S. E	Minneapolis
Swendseen, Carl G	Minneapolis
Taft, John O	Minneapolis
Taylor, Rood	Minneapolis
Ternstrom, O. H	Minneapolis
Thomas, Geo. E	Minneapolis
Thomas, Geo. H	Minneapolis
Thomas, Gilbert J	Minneapolis
Thompson, H. H	Minneapolis
Tingdale, A. C	Minneapolis
Trueman, H. S	Minneapolis
Tunstead, Hugh	Minneapolis
Turnacliff, D. D	Minneapolis
Tyrrell, C. C	Minneapolis
Ude, Walter H	Minneapolis
Ulrich, Henry L	Minneapolis
Undine, Clyde	Minneapolis
Urner, John A	Minneapolis
Vik, A. Elliot	Minneapolis
Vogtel, Melvin A	Minneapolis
Voyer, E. O	Minneapolis
Wahlquist, Harold F	Minneapolis
Waldron, Carl W	Minneapolis
Wall, C. R	Minneapolis
Wangensteen, O. H	Minneapolis
Wanous, E. Z	Minneapolis
Ward, A. W	Minneapolis
Ward, Percy A	Minneapolis
Warham, T. T	Minneapolis
Watson, J. A	Minneapolis
Webb, R. C	Minneapolis
Weisman, S. A	Minneapolis
Welles, H. J	Minneapolis
Wethall, A. G	Minneapolis
Wetherby, Macnider	Minneapolis
Weum, T. Wm	Minneapolis
White, S. Marx	Minneapolis
White, Willard D	Minneapolis
Widen, W. F	Minneapolis
Wiese, H. F. B	Minneapolis
Wilcox, Archa E	Minneapolis
Wilder, Robert L	Minneapolis
Wilken, Paul A	Minneapolis
Willcutt, Clarence	Minneapolis
Williams, H. L	Minneapolis
Williams, Robert	Minneapolis
Winther, Nora M. C	Minneapolis
Wittich, F. W	Minneapolis
Wohlrabe, A. A	Minneapolis
Wood, Douglas F	Minneapolis
Woodworth, Elizabeth	Minneapolis
Wright, C. B	Minneapolis
Wright, Charles Darcy	Minneapolis
Wright, Franklin R	Minneapolis
Wyatt, O. S	Minneapolis
Wynne, H. M. N	Minneapolis
Yoerg, O. W	Minneapolis
Zanger, Isabelle M	Minneapolis
Zaworski, E. A	Minneapolis
Zierold, A. A	Minneapolis
Ziskin, Thos	Minneapolis

HOUSTON-FILLMORE COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, October.

President	
Anderson, N. E	Harmony
Secretary	
Palmer, R. N	Lanesboro
Anderson, N. E	Harmony
Beiswanger, R. H	Wykoff
Belote, G. B	Caledonia
Canfield, W. W	Houston
Davis, I. G	Rushford
Drake, F. A	Lanesboro
Eby, C. B	Spring Valley
Edward, George	Canton
Grinnell, W. B	Preston
Helland, G. M	Spring Grove
Helland, J. W	Spring Grove
Johnson, Wm. E	Caledonia
Lannin, J. C	Mabel
Lommen, A. P	Lanesboro
Nass, H. A	Mabel
Nehring, J. P	Preston
Onsgard, L. K., Jr	Houston
Onsgard, L. K., Sr	Houston
Palmer, R. N	Lanesboro
Tierney, C. M	Harmony
Williams, R. V	Rushford
Woodruff, C. W	Chatfield

KANDIYOHI-SWIFT COUNTY MEDICAL SOCIETY

Regular meetings, monthly.
Annual meeting, December.

President	
Arnson, J. M	Benson
Secretary	
Scofield, C. L	Benson
Anderson, R. E	Willmar
Arnson, J. M	Benson
Behmler, F. W	Appleton
Branton, A. F	Willmar
Branton, B. J	Willmar
Daignault, Oscar	Benson
Dowswell, W. J	Kerkhoven
Fiksdal, M. J	Willmar
Fredrickson, Alice	Lake Lillian
Fredrickson, Guy	Lake Lillian
Frisch, F. P	Willmar
Frost, E. H	Willmar
Giere, S. W	Benson
Hodapp, R. J	Willmar
Hutchinson, Henry	New London
Jacobs, John C	Willmar
Jensen, Herman H	Atwater
Johnson, Hans	Kerkhoven
Kaufman, Wm	Appleton
Rains, J. M	Willmar
Scofield, C. L	Benson
Smith, B. F	Willmar
Thompson, Arthur	Raymond

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday each month except December, January, February and March.
Annual meeting, first Tuesday in October.

President	
Yaeger, W. W	Ivanhoe
Secretary	
Workman, H. M	Tracy
Bossingham, O. N	Lake Benton
Ford, Burton C	Marshall
Germo, Chas	Balaton
Golden, C. M	Tyler
Gray, F. D	Marshall
Hermanson, Peter E	Hendricks
Hoidale, A. D	Tracy
Jacquot, G. L	Marshall
Olson, Archibald	Hendricks
Persons, C. E	Marshall
Robertson, J. B	Cottonwood
Sanderson, E. T	Minneota
Thordarson, Theo	Minneota
Vadheim, A. L	Tyler
Valentine, W. H	Tracy
Workman, H. M	Tracy
Workman, W. G	Tracy
Yaeger, W. W	Ivanhoe

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, January.

President	
Trutna, Thos	Silver Lake
Secretary	
Jensen, A. H	Hutchinson
Clement, John B	Lester Prairie
Crow, E. R	Arlington
Holm, H. H	Glencoe
Jensen, A. H	Hutchinson
Klima, W. W	Stewart
Langhoff, A. H	Glencoe
Ninneman, Newton N	Silver Lake
Remple, D. D	Brownton
Sahr, Walter G	Hutchinson
Scholpp, O. W	Hutchinson
Sheppard, Fred	Hutchinson
Sheppard, P. E	Hutchinson
Trutna, Thos	Silver Lake

MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, March, June and September.
Annual meeting, December.

President	
Dulude, S. S	Dassel
Secretary	
Danielson, K. A	Litchfield
Brigham, Frank	Watkins
Danielson, K. A	Litchfield
Dulude, S. S	Dassel
Edwards, Gordon C	Grove City
Hoeper, Philip G. E	Litchfield
O'Connor, D. C	Eden Valley
Peterson, A. C	Dassel
Robertson, A. W	Litchfield
Wilmot, H. E	Litchfield

---

*Deceased.

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of each month except June, July and August.
Annual meeting, last Thursday in November.

President	
Morse, M. P.	LeRoy
Secretary	
Sheedy, C. L.	Austin
Allen, A. W.	Austin
Allen, Chas. C.	Austin
Cobb, Willis F.	Lyle
Coleman, F. B.	Austin
Cronwell, B. J.	Austin
Ewbank, John N.	Blooming Prairie
Greene, H. H.	Austin
Havens, J. G. W.	Austin
Hegge, O. H.	Austin
Hegge, R. S.	Austin
Henslin, A. E.	Leroy
Hertel, G. E.	Austin
Leck, Clifford C.	Austin
Lommen, P. A.	Austin
McKenna, J. K.	Austin
Melzer, G. R.	Lyle
Mitchell, R. S.	Grand Meadow
Morrow, James J.	Austin
Morse, M. P.	Leroy
Robertson, Paul A.	Austin
Sheedy, C. L.	Austin

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, June and September.
Annual meeting, December.

President	
McKeon, Joseph O.	Montgomery
Secretary	
Daniels, Jared W.	St. Peter
Aitkens, H. B.	Le Center
Covell, Walter W.	St. Peter
Daniels, Jared W.	St. Peter
Dodge, Frank A.	Le Sueur
Ericson, Swan	Le Sueur
Freeman, Geo. H.	St. Peter
Gully, Raymond J.	St. Peter
Hiniker, Peter J.	Le Sueur
Holtan, Theodore	Waterville
Kerschbaumer, Louisa	St. Peter
Lenander, Melvin E.	St. Peter
McKechnie, Wilfred	St. Peter
McKeon, Joseph O.	Montgomery
Peterson, Magnus C.	St. Peter
Stewart, N. W.	Lead, South Dakota
Strathern, Fred P.	St. Peter
Traxler, Felix J.	Henderson
Wolner, Oscar H.	St. Peter

OLMSTED COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, November.

President	
Berkman, D. M.	Rochester
Secretary	
Piper, M. C.	Rochester
Adams, S. F.	Rochester
Adson, A. W.	Rochester
Allan, F. N.	Rochester
Allen, E. V.	Rochester
Allen, Raymond B.	Rochester
Allen, R. W.	Rochester
Allen, W. A.	Rochester
Alvarez, W. C.	Rochester
Amberg, Samuel	Rochester
Anderson, C. M.	Rochester
Anderson, M. J.	Rochester
Anderson, R. M.	Rochester
Anderson, R. S.	Rochester
Balfour, D. C.	Rochester
Ball, R. G.	Rochester
Bannick, E. G.	Rochester
Barborka, C. J.	Rochester
Bargen, J. A.	Rochester
Barker, N. W.	Rochester
Barnes, A. R.	Rochester
Bartels, E. C.	Rochester
Bayard, H. F.	Rochester
Beaver, M. G.	Rochester
Benedict, W. L.	Rochester
Berger, Edmund H.	Rochester
Berkman, D. M.	Rochester
Berkman, J. M.	Rochester
Binger, M. W.	Rochester
Birkeland, I. W.	Rochester
Bliss, T. L.	Rochester
Boeck, W. C.	Rochester
Boothby, W. M.	Rochester
Bowing, H. H.	Rochester
Braasch, W. F.	Rochester
Bradley, J. W.	Rochester
Broders, A. C.	Rochester
Brown, A. E.	Rochester
Brown, G. E.	Rochester
Brown, P. W.	Rochester
Brown, Robert Whitcomb	Rochester
Bruner, J. M.	Rochester
Brunsting, L. A.	Rochester
Buie, L. A.	Rochester
Bumpus, H. C.	Rochester
Burke, C. F.	Rochester
Burkley, George Gregory	Rochester
Caldwell, J. M., Jr.	Rochester
Cameron, M. C., Jr.	Rochester
Camp, J. D.	Rochester
Carmichael, Hugh T.	Albany, N. Y.
Castleton, Kenneth B.	Rochester
Cathcart, Edward	Rochester
Chapman, C. B.	Rochester
Childrey, J. H.	Rochester
Christensen, E. E.	Rochester
Christianson, Harry Walter	Rochester
Church, Gerald Thompson	Rochester
Cilley, Earl I. L.	Rochester
Coakley, L. P.	Rochester
Coleman, J. H.	Rochester
Collins, D. C.	Rochester
Comfort, M. W.	Rochester
Conner, H. M.	Rochester
Cook, Edward Noble	Rochester
Cooke, H. H.	Rochester
Corr, W. P.	Rochester
Counseller, V. S.	Rochester
Cox, F. W.	Rochester
Craig, W. McK.	Rochester
Crenshaw, J. L.	Rochester
Crewe, J. E.	Rochester
Crisp, Norman William	Rochester
Cutts, Rollin Edward	Rochester
Daniels, Harry A.	Rochester
Daniels, L. E.	Rochester
Davis, A. C.	Rochester
Davison, H. L.	Rochester
Dawley, W. A.	Rochester
DeCarle, D. W.	Rochester
Decker, Fred H.	Rochester
Desjardins, A. U.	Rochester
Dixon, C. F.	Rochester
Dixon, R. K.	Rochester
Dolder, F. C.	Eyota
Donald, J. M.	Rochester
Down, H. I.	Rochester
Doyle, J. B.	Rochester
Drips, D. G.	Rochester
Droegemueller, E. H.	Rochester
Dukelow, Donald A.	Rochester
Dunlap, H. F.	Rochester
Emmons, W. F.	Rochester
Eusterman, G. B.	Rochester
Evans, Vernon L.	Rochester
Evarts, A. B.	Rochester
Farrell, H. J.	Rochester
Faust, L. S.	Rochester
Fauster, J. U., Jr.	Rochester
Fawcett, C. E.	Stewartville
Figi, F. A.	Rochester
Finney, W. P.	Rochester
Ford, F. A.	Rochester
Fortin, H. J.	Rochester
Fricke, R. E.	Rochester
Fulcher, O. H.	Rochester
Gaarde, F. W.	Rochester
Ghormley, R. K.	Rochester
Giffin, H. Z.	Rochester
Gillespie, James B.	Rochester
Goeckerman, W. H.	Rochester
Goldberg, Samuel L.	Rochester
Graham, A. S.	Rochester
Gray, H. K.	Rochester
Greene, C. H.	Rochester
Grimes, A. E., Jr.	Rochester
Habein, H. C.	Rochester
Haines, S. F.	Rochester
Hallenbeck, D. F.	Rochester
Hamm, Frank C.	Rochester
Hanlon, F. R.	Rochester
Hardeman, D. R.	Rochester
Harmeier, J. W.	Rochester
Harper, Frederick R.	Rochester
Harrington, S. W.	Rochester
Harris, Milo T.	Rochester
Harrison, Percy W.	Rochester
Hartman, H. R.	Rochester
Havens, F. Z.	Rochester
Hazen, S. Frank	Rochester
Heck, F. J.	Rochester
Heimdal, C. O.	Rochester
Helmholz, H. F.	Rochester
Hempstead, B. E.	Rochester
Hench, P. S.	Rochester
Henderson, M. S.	Rochester
Hewitt, Edith Swartwout	Rochester
Heyerdale, O. C.	Rochester
Hilding, Anderson C.	Rochester
Hillyard, L. V.	Rochester
Hilton, J. M.	Rochester
Holland, W. W.	Rochester
Horton, B. T.	Rochester
Humphrey, Arthur A.	Rochester
Hurt, A. S., Jr.	Rochester
Hurt, Holcombe Harris	Rochester
Hyde, T. L.	Rochester
Iber, Frank C.	Rochester
Imes, Pat R.	Rochester
Johnson, Ellsworth	Rochester
Johnson, H. W. E.	Rochester
Johnson, W. R.	Rochester
Jordan, F. M.	Rochester
Joyce, G. L.	Stewartville
Joyce, G. T.	Rochester
Judd, E. S.	Rochester
Kegaries, Donald L.	Rochester
Keith, H. M.	Rochester
Keith, N. M.	Rochester
Kellum, E. L.	Rochester
Kennedy, R. L. J.	Rochester
Kepler, E. J.	Rochester
Kernohan, J. W.	Rochester
Kilbourne, A. F.	Rochester
Kilgore, G. L.	Rochester
Kintner, A. R.	Rochester
Kirklin, B. R.	Rochester
Kirklin, Oren L.	Rochester
Kullman, Harold John	Rochester
Lang, Valorus F.	Rochester
Larson, Lawrence	Rochester
Learmonth, J. R.	Rochester
Leddy, E. T.	Rochester
Lemon, W. S.	Rochester
Lillie, H. I.	Rochester
Lillie, W. I.	Rochester
Lineberry, E. D.	Rochester
Lochead, D. C.	Rochester
Logan, A. H.	Rochester
Loney, W. R. R.	Rochester
Love, J. G.	Rochester
Luden, Georgine	Victoria, B. C.
Lundy, J. S.	Rochester
McCarty, R. B.	Rochester
McCaughan, J. M.	Rochester
McCuskey, C. F.	Rochester
McKaig, C. B.	Pine Island
McQuiston, James Stuart	Rochester
Magath, T. B.	Rochester
Magee, H. R.	Rochester
Major, S. G.	Rochester
Malmgren, G. E.	Rochester
Marshall. J. M.	Rochester
Mason, J. B.	Rochester
Masson, D. M.	Rochester
Masson, J. C.	Rochester

Mayo, C. H.	Rochester
Mayo, C. W.	Rochester
Mayo, J. G.	Rochester
Mayo, W. J.	Rochester
Maytum, C. K.	Rochester
Meland, Ernest L.	Rochester
Messick, Joseph M.	Rochester
Meyerding, H. W.	Rochester
Michie, Thomas C.	Rochester
Millet, Roscoe F.	Rochester
Moench, L. M.	Rochester
Moersch, F. P.	Rochester
Moersch, H. J.	Rochester
Mohardt, J. H.	Rochester
Montgomery, Hamilton	Rochester
Morehead, D. E.	Rochester
Morey, John Barnhart	Rochester
Morgan, S. F.	Rochester
Morton, H. B.	Rochester
Morton, Silvanus A.	Rochester
Mroz, R. J.	Rochester
Mueller, S. C.	Rochester
Mulholland, S. W.	Rochester
Murphy, G. T.	Rochester
Mussey, R. D.	Rochester
Nelson, W. L.	Rochester
New, G. B.	Rochester
Nickel, A. A. C.	Rochester
Norment, W. B.	Rochester
Offutt, S. R.	Rochester
Ohlinger, L. B.	Chicago, Illinois
O'Leary, P. A.	Rochester
Olson, E. A.	Pine Island
Overton, Lewis M.	Rochester
Parker, H. L.	Rochester
Patmos, Martin	Rochester
Pemberton, J. deJ.	Rochester
Peterson, J. A.	Rochester
Pfeffer, T. J.	Rochester
Phillips, John R.	Rochester
Piper, M. C.	Rochester
Plummer, H. S.	Rochester
Plummer, W. A.	Rochester
Pollock, L. W.	Rochester
Pomeroy, Rex K.	Rochester
Prangen, A. D.	Rochester
Prescott, M. U.	Rochester
Prickman, L. E.	Rochester
Priestley, J. B.	Rochester
Priestley, J. T.	Rochester
Puestow, C. B.	Rochester
Randall, L. M.	Rochester
Rankin, F. W.	Rochester
Rentschler, E. B.	Rochester
Rice, Carl O.	Rochester
Rieniets, J. H.	Rochester
Rivers, A. B.	Rochester
Rixford, E. L.	Rochester
Robertson, H. E.	Rochester
Rogers, J. C. T.	Rochester
Rosenow, E. C.	Rochester
Rowntree, L. G.	Rochester
Ruedemann, Ehrkardt	Rochester
Ruffin, Willcox	Rochester
Rynearson, E. H.	Rochester
Sanford, A. H.	Rochester
Schaefer, J. F.	Rochester
Scherer, Leslie R.	Rochester
Schunk, Peter M.	Rochester
Scott, D. E.	Rochester
Serrurier, Laurence R.	Rochester
Shane, J. H.	Rochester
Sharp, Jay E.	Rochester
Sheldon, W. D.	Rochester
Smith, F. L.	Rochester
Smith, H. L.	Rochester
Smith, Newton D.	Rochester
Snell, A. M.	Rochester
Spooner, Alexander D.	Rochester
Stacy, L. J.	Rochester
Stark, W. B.	Rochester
Stephenson, George W.	Rochester
Steven, George	Byron
Stevens, R. B.	Rochester
Steward, J. A.	Rochester
Stewart, C. C., Jr.	Rochester
Stuck, Walter Goodloe	Rochester
Stuhler, L. G.	Rochester
Sutherland, C. G.	Rochester
Sutton, L. F.	Mazeppa
Swart, H. A.	Rochester
Taylor, James E. C.	Rochester
Thornton, Harold C.	Rochester
Tovell, Ralph M.	Rochester
Tyvand, Raymond E.	Rochester
Vanzant, F. R.	Rochester
Verbrugghen, A. H.	Rochester
Vinson, P. P.	Rochester
Wagener, H. P.	Rochester
Wakefield, Elmer G.	Rochester
Waldron, G. W.	Rochester
Walker, M. A.	Rochester
Walters, Waltman	Rochester
Watkins, C. H.	Rochester
Watson, James R.	Rochester
Weber, H. M.	Rochester
Webster, W. W.	Rochester
Weir, J. F.	Rochester
Wellbrock, W. L. A.	Rochester
Wharton, G. K.	Rochester
Wilbur, D. L.	Rochester
Williams, H. L., Jr.	Rochester
Willius, F. A.	Rochester
Wilson, L. B.	Rochester
Wolff, Herman J.	Rochester
Woltman, H. W.	Rochester
Wood, H. G.	Rochester
Zinn, C. J.	Rochester

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Otter Tail, Wilkin, Grant and Douglas Counties.
Regular meetings, second Wednesday in January, April and July.
Annual meeting, second Wednesday in October.

President

Lewis, A. J.	Henning

Secretary

Heiberg, E. A.	Fergus Falls

Baker, A. C.	Fergus Falls
Baker, N. H.	Fergus Falls
Boysen, P.	Pelican Rapids
Brabec, F. J.	Perham
Broker, W. S.	Battle Lake
Burnap, W. L.	Fergus Falls
Combacker, L. C.	Fergus Falls
Drill, H. E.	Battle Lake
Drought, W. W.	Fergus Falls
Esser, J.	Perham
Estrem, C. O.	Fergus Falls
Freeborn, J. A.	Fergus Falls
Haskell, A. D.	Alexandria
Heiberg, E. A.	Fergus Falls
Houkom, B.	Fergus Falls
Johnson, O. V.	Fergus Falls
Kemp, M. W.	Fergus Falls
Kierland, P. E.	Alexandria
Kittelson, T. N.	Fergus Falls
Lee, W. A.	Fergus Falls
Leibold, H. H.	Parkers Prairie
Lewis, A. J.	Henning
Love, Fred A.	Carlos
McMahon, L. H.	Breckenridge
Naegeli, F.	Fergus Falls
Nelson, O. N.	Battle Lake
Nelson, W. I.	Underwood
Otto, H. C.	Frazee
Parson, L. R.	Elbow Lake
Patterson, W. L.	Fergus Falls
Paulson, T. S.	Fergus Falls
Platt, F. B.	Battle Lake
Satersmoen, T.	Pelican Rapids
Serkland, J. C.	Rothsay
Tanquist, E. J.	Alexandria
Vail, J. B.	Henning
Wray, W. E.	Campbell
Ylvisaker, R. S.	Fergus Falls

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of month.
Annual meeting, last Monday in January.

President

Holcomb, O. W.	St. Paul

Secretary

Schulze, A. G.	St. Paul

Abbott, John	St. Paul
Ahrens, A. E.	St. Paul
Ahrens, A. H.	St. Paul
Alberts, Max W.	St. Paul
Alden, J. F.	St. Paul
Aldes, Harry	St. Paul
Alexander, F. H.	St. Paul
Allen, Mason	St. Paul
Arends, A. L.	Wright
Armstrong, J. M.	St. Paul
Arnquist, A. S.	St. Paul
Aurelius, J. R.	St. Paul
Backus, Andrew S.	St. Paul
Bacon, Knox	San Diego, Cal.
Bacon, L. C.	St. Paul
Balcome, F. E.	St. Paul
Barry, L. W.	St. Paul
Barsness, Nellie	St. Paul
Beadie, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Bell, C. C.	St. Paul
Bennion, P. H.	St. Paul
Bentley, Norman P.	St. Paul
Berrisford, P. D.	St. Paul
Binger, H. E.	St. Paul
Birnberg, T. L.	St. Paul
Bock, R. A.	St. Paul
Boeckmann, Egil	St. Paul
Bohland, E. H.	St. Paul
Bole, R. S.	St. Paul
Borg, J. F.	St. Paul
Bouma, L. R.	St. Paul
Brand, G. D.	St. Paul
Bray, E. R.	St. Paul
Brimhall, J. B.	St. Paul
Brodie, Walter D.	St. Paul
Brooks, G. F.	St. Paul
Brown, J. C.	St. Paul
Burch, F. E.	St. Paul
Burfiend, G. H.	St. Paul
Burns, F. W.	St. Paul
Burns, R. M.	St. Paul
Burton, Carl G.	St. Paul
Busher, H.	St. Paul
Caldwell, James P.	St. Paul
Caldwell, Kenneth S.	St. Paul
Cameron, J. A.	St. Paul
Campbell, J. E.	South St. Paul
Cannon, Harry	St. Paul
Carroll, W. C.	St. Paul
Carter, Fred G.	St. Paul
Chatterton, C. C.	St. Paul
Christiansen, A.	St. Paul
Christison, J. T.	St. Paul
Clark, T. C.	Minneapolis
Cobb, S. G.	St. Paul
Colby, Woodard	St. Paul
Cole, Wallace H.	St. Paul
Collie, H. G.	St. Paul
Colvin, A. R.	St. Paul
Conner, William	Minneapolis
Connor, C. E.	St. Paul
Cottam, Gilbert G.	St. Paul
Countryman, Roger S.	St. Paul
Cowern, E. W.	North St. Paul
Critchfield, L. R.	St. Paul
Crump, J. W.	St. Paul
Culligan, John M.	St. Paul
Culligan, Leo	Mendota
Dack, L. G.	St. Paul
Darling, J. B.	St. Paul
Daugherty, E. B.	St. Paul
Daugherty, L. E.	St. Paul
Davis, Herbert	St. Paul
Davis, William	St. Paul
Dedolph, K.	St. Paul
Derauf, B. I.	St. Paul
Dickson, Thomas H., Jr.	St. Paul
Dittman, Geo. C.	St. Paul
Dohm, A. J.	St. Paul
Donohue, P. F.	St. Paul
Drake, C. B.	St. Paul
Dunn, J. N.	St. Paul
Dunne, G. P.	St. Paul
Earl, George A.	St. Paul
Earl, Robert O.	St. Paul
Edlund, G.	St. Paul

Ely, O. S.	South St. Paul
Emerson, E. C.	St. Paul
Endress, E. K.	St. Paul
Engberg, E. J.	St. Paul
Ernest, G. C.	St. Paul
Eshelby, E. C.	St. Paul
Fahey, E. W.	St. Paul
Ferguson, J. C.	St. Paul
Fesler, H. H.	St. Paul
Fogarty, C. W.	St. Paul
Foley, F. E. B.	St. Paul
Freeman, C. D.	St. Paul
Fulton, J. F.	St. Paul
Gager, E. C.	St. Paul
Garbrecht, Arthur	St. Paul
Gardiner, D. G.	St. Paul
Geer, E. K.	St. Paul
Gehlen, J. N.	St. Paul
Geist, George A.	St. Paul
Ghent, C. Harry	St. Paul
Ghent, M. M.	St. Paul
Gilfillan, J. S.	St. Paul
Ginsberg, Wm.	St. Paul
Goltz, E. V.	St. Paul
Grant, Hendrie W.	St. Paul
Gratzek, Thomas	St. Paul
Gruenhagen, A. P.	St. Paul
Hagaman, Geo. K.	St. Paul
Hall, A. R.	St. Paul
Hall, Henry H.	St. Paul
Hammes, E. M.	St. Paul
Hammond, J. F.	St. Paul
Harmon, G. E.	St. Paul
Hartfiel, Wm. F.	St. Paul
Hartley, E. C.	St. Paul
Hauser, Victor	St. Paul
Hawkins, V. J.	St. Paul
Heath, A. C.	St. Paul
Heck, Wm. W.	St. Paul
Hedenstrom, Frank G.	St. Paul
Hengstler, W. H.	St. Paul
Hensel, C. N.	St. Paul
Herrmann, E. T.	St. Paul
Hesselgrave, S. S.	St. Paul
Hilger, A. W.	St. Paul
Hilger, D. D.	St. Paul
Hilger, L. A.	St. Paul
Hiniker, Louis P.	St. Paul
Hochfilzer, J. J.	St. Paul
Hoff, Alfred	St. Paul
Hoffman, Max H.	St. Paul
Holcomb, J. T.	St. Paul
Holcomb, O. W.	St. Paul
Holt, John E.	St. Paul
Howard, W. S.	St. Paul
Hullsiek, Harold	St. Paul
Hullsiek, Richard B.	St. Paul
Hultkrans, Joel C.	St. Paul
Hunt, H. E.	St. Paul
Ide, A. W.	St. Paul
Ikeda, Kano	St. Paul
Johnson, Asa M.	St. Paul
Johnson, H. C.	St. Paul
Johnson, J. Arthur	St. Paul
Johnson, Ray G.	St. Paul
Johnson, T. H.	St. Paul
Jones, D. C.	St. Paul
Jones, E. M.	St. Paul
Kadesky, David	St. Paul
Kamman, Gordon R.	St. Paul
Kannary, E. L.	St. Paul
Kelly, John V.	St. Paul
Kelly, Paul	St. Paul
Kenefick, E. V.	St. Paul
Kennedy, Wm. A.	St. Paul
Kenny, H. F.	St. Paul
Kesting, Herman	St. Paul
King, George L.	St. Paul
King, Z. P.	St. Paul
Kistler, A. S.	St. Paul
Klein, H. N.	St. Paul
Knauff, M. K.	St. Paul
Kvitrud, G.	St. Paul
Langenderfer, F. V.	St. Paul
Larsen, C. L.	St. Paul
Lax, Morris H.	St. Paul
Leahy, B.	St. Paul
Leavenworth, R. O.	St. Paul
Leitch, A.	St. Paul
Leonard, G. J.	St. Paul
Lepak, J. A.	St. Paul
Lerche, William	Cable, Wis.
Levin, Bert	St. Paul
Lewis, W. W.	St. Paul
Lick, C. L.	St. Paul
Little, W. J.	St. Paul
Lowe, Earl R.	South St. Paul
Lowe, Thomas	South St. Paul
Lundholm, A. M.	St. Paul
McBeath, Ewing C.	New York City
McCarthy, W. R.	St. Paul
McClanahan, J. H.	White Bear
McClanahan, T. S.	White Bear
McCloud, C. N.	St. Paul
McKeon, Owen	St. Paul
McLaren, Jennette	St. Paul
McNevin, C. F.	St. Paul
Madden, John F.	St. Paul
Martineau, J. L.	St. Paul
Meyerding, E. A.	St. Paul
Moga, John A.	St. Paul
Mogilner, S. N.	St. Paul
Molander, H. A.	St. Paul
Moquin, Marie A.	St. Paul
Morrissey, F. B.	St. Paul
Mortensen, N. G.	St. Paul
Moss, M. N.	St. Paul
Moynihan, T. J.	St. Paul
Muller, R. Theo.	St. Paul
Myers, Thos.	St. Paul
Naegeli, Arnold E.	St. Paul
Neher, R. H.	St. Paul
Nelson, L. A.	St. Paul
Nippert, H. T.	St. Paul
Noble, John F.	St. Paul
Nordin, Charles G.	St. Paul
Norris, E. H.	St. Paul
Nye, Katherine A.	St. Paul
Nye, Lillian	St. Paul
O'Brien, H. J.	St. Paul
O'Connor, J. P.*	St. Paul
O'Connor, Loren J.	St. Paul
Oerting, Harry	St. Paul
Ogden, Warner	St. Paul
Ohage, Justus	St. Paul
Ohage, Justus, Jr.	St. Paul
Olson, Chas. A.	St. Paul
Ostergren, E. W.	St. Paul
Page, C. V.	St. Paul
Pearson, F. R.	St. Paul
Pedersen, A. H.	St. Paul
Perry, C. G.	St. Paul
Peterson, V. N.	St. Paul
Plondke, F. J.	St. Paul
Prendergast, Harold J.	St. Paul
Ramsey, W. R.	St. Paul
Richards, E. T. F.	St. Paul
Richardson, Harold E.	St. Paul
Ritchie, H. P.	St. Paul
Rogers, J. T.	St. Paul
Rosenthal, Robert	St. Paul
Rothrock, J. L.	St. Paul
Rothschild, H. J.	St. Paul
Roy, Philemon	St. Paul
Ruhberg, Geo. N.	St. Paul
Rutherford, W. C.	St. Paul
Ryan, John J.	St. Paul
Ryan, Mark E.	St. Paul
Satterlund, V. L.	St Paul
Savage, F. J.	St. Paul
Schoch, R. B.	St. Paul
Schons, E.	St. Paul
Schuldt, F. C.	St. Paul
Schulze, A. G.	St. Paul
Schwyzer, Arnold	St. Paul
Senkler, G. E.	St. Paul
Setzer, H. J.	St. Paul
Shannon, W. R.	St. Paul
Shellman, John L.	St. Paul
Shillington, M. A.	St. Paul
Short, Jacob	St. Paul
Simon, B. F.	St. Paul
Singer, Benjamin J.	St. Paul
Skinner, H. O.	St. Paul
Snyder, G. W.	St. Paul
Sohlberg, O. I.	St. Paul
Souster, B. B.	St. Paul
Sprafka, J. M.	St. Paul
Sterner, E. G.	St. Paul
Sterner, O. W.	St. Paul
Stevens, F. A.	Lake Elmo
Stewart, Alexander	St. Paul
Stierle, Adolph	St. Paul
Stinnette, S. E.	St. Paul
Stolpestad, H. L.	St. Paul
Swanson, E. O.	St. Paul
Swanson, John A.	St. Paul
Swendson, J. J.	St. Paul
Taylor, H. L.	St. Paul
Teisberg, C. B.	St. Paul
Tregilgas, H. R.	South St. Paul
Van Slyke, C. A.	St. Paul
Veirs, Dean	St. Paul
Veirs, Ruby Smith	St. Paul
Von der Weyer, William	St. Paul
Waas, C. W.	St. Paul
Warnock, R. W.	St. Paul
Warren, E. L.	St. Paul
Webber, Fred L.	St. Paul
Welch, M. C.	St. Paul
Werner, O. S.	Cambridge
Wheeler, M. W.	St. Paul
Whitacre, J. C.	St. Paul
Whitcomb, E. H.	St. Paul
White, J. S.	St. Paul
Whitmore, F. W.	St. Paul
Williams, Clayton K.	St. Paul
Williamson, Geo. A.	St. Paul
Winnick, J. B.	St. Paul
Wold, K. C.	St. Paul
Zimmermann, H.	St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Marshall, Polk, Pennington, Red Lake, Roseau, Norman and Mahnomen Counties.

Regular meetings, second Tuesday in April, September and December.

Annual meeting, December.

President

Stuurmanns, S. H.	Erskine

Secretary

Oppegaard, C. L.	Crookston
Adkins, C. M.	Grygla
Anderson, W. S.	Minneapolis
Berge, David O.	Thief River Falls
Bernard, B. C.	Thief River Falls
Bertleson, O. L.	Crookston
Biedermann, Jacob	Thief River Falls
Blegen, H. M.	Warren
Bohl, George W.	Ada
Bowers, J. T.	Thief River Falls
Bratrud, O. Edw.	Thief River Falls
Brosseau, J. E.	Argyle
Brown, L. L.	Crookston
Button, A. J.	Greenbush
Delmore, J. L.	Roseau
Dunlop, A. H.	Crookston
Edstrom, Henry	Crookston
Engstrand, O. J.	Warren
Froehlick, H. W.	Thief River Falls
Henney, W. H.	McIntosh
Hodgson, H. H.	Crookston
Hollands, W. H.	Fisher
Holmstrom, C. H.	Warren
Holte, Halvor	Crookston
Kahala, Arthur	Crookston
Kirk, G. P.	East Grand Forks
Leitch, Neil M.	Warroad
Locken, O. E.	Crookston
Lynde, Orrin	Thief River Falls
Mellby, O. F.	Thief River Falls
Mercil, W. F.	Crookston
Morley, G. A.	Crookston
Nelson, H. E.	Crookston
Norman, J. F.	Crookston
Ohnstad, J. L.	McIntosh
Oppegaard, C. L.	Crookston
Oppegaard, M. O.	Crookston
Overend, K. V.	Hallock
Paradis, W. G.	Crookston
Parsons, J. G.	Crookston
Rasmussen, C. C.	Fertile
Roy, J. A.	Red Lake Falls
Sather, Allen	Fosston
Shaleen, A. W.	Hallock
Shedlov, A.	Fosston
Shelland, J. T.	Ada
Smith, Archie M.	Thief River Falls
Stuurmanns, S. H.	Erskine
Swedenburg	Thief River Falls
Turnbull, Robert	Fosston
Watson, N. M.	Red Lake Falls
Wattam, G. S.	Warren
Wiltrout, I. G.	Oslo

---

*Deceased.

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, at call of President.
Annual meeting, May.

President	
Reineke, G. F.	New Ulm
Secretary	
Meierding, Wm. A.	New Ulm
Abraham, Arden L.	Gibbon
Dubbe, F. H.	New Ulm
Dysterheft, Carl J.	Gaylord
Fritsche, Albert	New Ulm
Fritsche, Carl J.	New Ulm
Fritsche, L. A.	New Ulm
Gibbons, F. C.	Comfrey
Goblirsch, A. P.	Sleepy Eye
Hammermeister, Theo.	New Ulm
Hovde, Rolf	Winthrop
Jamieson, Earl	Walnut Grove
Just, Herman J.	Lafayette
Kiefer, M. A.	Sleepy Eye
Kolset, Carl D.	Sanborn
Lindahl, Merlyn J.	Winthrop
McLane, Evelyn	Sleepy Eye
McLane, Wm. O.	Sleepy Eye
Meierding, Wm. A.	New Ulm
Pederson, O. J.	Hanska
Peterson, R. A.	Vesta
Reineke, G. F.	New Ulm
Rothenburg, J. C.	Springfield
Saffert, Cornelius	New Ulm
Scherer, R. G.	Morgan
Schoch, J. L.	New Ulm
Seifert, O. J.	New Ulm
Shrader, J. S.	Springfield
Vogel, J. H.	New Ulm
Weiser, Geo. B.	New Ulm
Wellcome, J. W. B.	Sleepy Eye
Wieckman, Fred H.	Sleepy Eye
Wohlrabe, C. F.	Springfield
Wohlrabe, Edwin J.	Springfield

RICE COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, December.

President	
Murdoch, J. M.	Faribault
Secretary	
Plonske, C. J.	Faribault
Babcock, F. M.	Northfield
Backe, Edmund	Kenyon
Beede, Ethel R.	Faribault
Davis, F. U.	Faribault
Dugan, Lawrence F.	Faribault
Dungay, Neil S.	Northfield
Engstrom, Frederick A.	Wanamingo
Francis, D. W.	Morristown
Haessly, S. B.	Faribault
Hanson, A. M.	Faribault
Hanson, E. C.	Faribault
Haynes, A. L.	Faribault
Huxley, F. R.	Faribault
Kanne, C. W.	Faribault
Lane, Laura A.	Northfield
Lende, Norman	Faribault
Lexa, F. J.	Lonsdale
McBroom, D. E.	Cambridge
Mayland, M. L.	Faribault
Meyer, R. F.	Faribault
Moses, Joseph	Northfield
Murdoch, J. M.	Faribault
Neseth, O. S.	Kenyon
Nickerson, W. S.	Faribault
Plonske, C. J.	Faribault
Robilliard, C. M.	Faribault
Robilliard, W. H.	Faribault
Rumpf, C. W.	Faribault
Rumpf, W. H.	Faribault
Smith, P. A.	Faribault
Stewart, Gwendolyn	Faribault
Thorson, O. P.	Northfield
Traeger, C. A.	Faribault
Warren, F. S.	Faribault
Wilson, Warren	Northfield
Wilson, W. E.	Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

St. Louis, Lake, Cook, and Carlton Counties.
Regular meetings, second Thursday each month, except July.
Annual meeting, second Thursday, October.

President	
Lepak, F. J.	Duluth
Secretary	
Fischer, M. McC.	Duluth
Abbott, Wm. P.	Duluth
Adams, B. S.	Hibbing
Alexander, Clifford E.	Duluth
Arminen, K. V.	Duluth
Armstrong, E. L.	Duluth
Athens, A. G.	Duluth
Ayers, G. T.	Ely
Bagley, W. R.	Duluth
Bardon, Richard	Duluth
Barney, L. A.	Duluth
Berdez, G. L.	Duluth
Bergquist, K. E.	Duluth
Bianco, A. J.	Duluth
Birkland, O. N.	Hibbing
Blacklock, S. S.	Hibbing
Blakely, C. C.	Barnum
Boman, P. G.	Duluth
Bowen, R. L.	Hibbing
Boyer, S. H.	Duluth
Braden, A. J.	Duluth
Braverman, N. J.	Duluth
Bray, C. W.	Biwabik
Bullen, F. W.	Hibbing
Burns, R. L.	Two Harbors
Cantwell, F. W.	International Falls
Carstens, C. F.	Hibbing
Chapman, T. L.	Duluth
Cheney, E. L.	Duluth
Christensen, E. P.	Two Harbors
Clark, F. F.	Duluth
Clement, Gage	Duluth
Collins, A. N.	Duluth
Collins, H. C.	Duluth
Coventry, W. A.	Duluth
Cummings, Damon Ward	Hibbing
Dahlin, I. T.	Aurora
Davis, B. F.	Duluth
Doolittle, L. E.	Duluth
Doyle, George C.	Duluth
Drenning, F. C.	Duluth
Eckman, P. F.	Duluth
Ekblad, J. W.	Duluth
Eklund, W. J.	Duluth
Elias, F. J.	Duluth
Eppard, R. M.	Cloquet
Estrem, T. A.	Hibbing
Ewens, H. B.	Virginia
Fawcett, K. R.	Duluth
Ferriera, G. J.	Duluth
Fischer, M. McC.	Duluth
Forbes, R. S.	Duluth
Forster, W. L.	Hibbing
French, H. S.	Duluth
Gillespie, M. G.	Duluth
Gillespie, N. H.	Duluth
Goodman, C. E.	Virginia
Graham, David	Duluth
Graham, R. D.	Duluth
Graham, Robert	Duluth
Graves, W. N.	Duluth
Grawn, F. A.	Duluth
Hall, A. E.	Virginia
Haney, C. L.	Duluth
Harris, C. N.	Hibbing
Hatch, W. E.	Duluth
Hathaway, S. J.	Proctor
Hayes, M. F.	Nashwauk
Haynes, M. H.	Duluth
Hiemark, O. E.	Duluth
Hill, F. E.	Duluth
Hirschboeck, F. J.	Duluth
Hirschfield, M. S.	Duluth
Holderman, J. W.	Duluth
Huseby, H. W.	Floodwood
Jacobson, C.	Chisholm
Jensen, T. J.	Duluth
Johnson, A. R.	Eveleth
Kerlan, Milton	New York, N. Y.
Kiesling, I. H.	Nashwauk
King, W. S.	Eveleth
Klein, Harry	Duluth
Kliman, F. E.	Duluth
Knapp, F. N.	Duluth
Kohlbry, C. O.	Duluth
Kotchevar, F. R.	Eveleth
Kraft, Peter	Duluth
Krantz, C. I.	Duluth
Kuth, J. R.	Duluth
Laird, A. T.	Nopeming
Lamont, J. G.	Nopeming
Lenont, C. B.	Virginia
Lepak, F. J.	Duluth
Litman, S. M.	Duluth
Lum, C. E.	Nisswa
McCarty, P. D.	Ely
McComb, C. F.	Duluth
McCoy, Mary	Duluth
McDaniel, S. P.	Mountain Iron
McDonald, A. L.	Duluth
McGiffert, E. N.	Duluth
McHaffie, O. L.	Duluth
McNutt, J. R.	Duluth
MacFarlane, P. H.	Chisholm
MacRae, G. C.	Duluth
Magie, W. H.	Duluth
Magney, F. H.	Duluth
Manley, J. R.	Duluth
Marsh, H. L.	Eveleth
Martin, E. T.	Duluth
Martin, W. C.	Duluth
Mayne, R. M.	Duluth
Merriman, L. L.	Duluth
Moe, R. J.	Duluth
Moe, Thomas	Moose Lake
Monroe, P. B.	Two Harbors
Mooney, L. P.	Marble
More, C. W.	Eveleth
Morsman, L. W.	Hibbing
Morss, C. R.	Zumhrota
Murray, D. D.	Duluth
Myers, Fred	Eveleth
Nelson, E. H.	Chisholm
Nelson, R. L.	Duluth
Nicholson, M. A.	Duluth
Olson, A. E.	Duluth
Oredson, O. A.	Duluth
Parker, O. W.	Ely
Pennie, D. F.	Duluth
Power, J. E.	Duluth
Raadquist, C. S.	Hibbing
Raiter, F. W. S.	Cloquet
Raiter, R. F.	Cloquet
Robinson, J. M.	Duluth
Rood, D. C.	Duluth
Rowe, O. W.	Duluth
Ruby, F. McK.	Hibbing
Rudie, P. S.	Duluth
Ryan, W. J.	Duluth
St. Clair, G. G.	Duluth
Saarf, O. E.	Baudette
Samson, E. R.	Chisholm
Scherer, C. A.	Duluth
Schroeder, C. H.	Duluth
Seashore, D. E.	Duluth
Shapiro, E. Z.	Duluth
Shaw, A. W.	Buhl
Shimonek, S. W.	Hibbing
Sinamark, A.	Hibbing
Sisler, C. E.	Grand Rapids
Slyfield, F. F.	Duluth
Smith, C. M.	Duluth
Smith, E. K.	Duluth
Spicer, F. W.	Duluth
Strathern, M. L.	Gilbert
Strobel, W. G.	Duluth
Stuart, A. B.	Cloquet
Sukeforth, L. A.	Duluth
Sutherland, H. N.	Ely
Swenson, A. O.	Duluth
Taylor, C. W.	Duluth
Tibbetts, M. H.	Duluth

Tilderquist, D. L.	Duluth
Tuohy, E. L.	Duluth
Urberg, S. E.	Duluth
Vercellini, C. E.	Duluth
Walker, A. E.	Duluth
Webber, E. E.	Duluth
Weirick, H. R.	Hibbing
West, E. J.	Duluth
Whalen, M. L.	Duluth
Wheeler, D. W.	Duluth
Wilkinson, Stella	Duluth
Winter, J. A.	Duluth
Young, T. O.	Duluth
Young, V. A.	Duluth
Zlatowski, M.	Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, every two months in Winter—Every month in Summer.
Annual meeting, second Tuesday in June.

President	
Hebeisen, M. B.	Carver
Secretary	
Cervenka, C. F.	New Prague
Bohland, F. J.	Belle Plaine
Buck, F. H.	Shakopee
Cervenka, C. F.	New Prague
Eklund, E. J.	Norwood
Emmerson, W. S.	Mayer
Fischer, H. P.	Shakopee
Fischer, P. M.	Shakopee
Halgren, H. A.	Watertown
Hebeisen, M. B.	Carver
Henriksen, H. G.	Elko
Juergens, H. M.	Belle Plaine
Kolars, J. J.	Le Center
McKeon, James	St. Paul
Maertz, W. F.	New Prague
Martin, T. P.	Arlington
Nagel, H. D.	Waconia
Novak, E. E.	New Prague
Olson, C. J.	Belle Plaine
Ormond, D.	Waconia
Phillips, W. H.	Jordan
Reiter, H. W.	Shakopee
Schimelpfenig, G. T.	Chaska
Schneider, H. A.	Jordan
Simons, B. H.	Chaska
Westerman, A. E.	Montgomery
Westerman, F. C.	Montgomery
Wunder, H. E.	Shakopee

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Pipestone, Rock, Murray, Nobles, Cottonwood and Jackson Counties.
Annual meeting, November.

President	
Arnold, E. W.	Adrian
Secretary	
McKeown, E. G.	Pipestone
Arnold, E. W.	Adrian
Basinger, H. P.	Windom
Basinger, H. R.	Mountain Lake
Bateman, C. V.	Mountain Lake
Benjamin, M. B.	Jasper
Benjamin, W. G.	Pipestone
Bofenkamp, F. W.	Luverne
Bong, J. H.	Jasper
Brown, A. H.	Pipestone
Chadbourn, A. G.	Heron Lake
Chunn, Stanley S.	Lake Wilson
Cress, P. J.	Ellsworth
De Boer, H.	Edgerton
Ditmeier, L. M.	Jasper
Dolan, C. P.	Worthington
Doms, H. C.	Slayton
Dudley, J. H.	Windom
Engh, S.	Jackson
Halloran, W. H.	Jackson
Hilger, J. M.	Iona
Hitchings, W. S.	Lakefield
Kelling, Louis F.	Lakefield
Kendahl, A. M.	Jasper
Kilbride, E. A.	Worthington
Lowe, Thos.	Pipestone
McCrea, James	Fulda
McKeown, E. G.	Pipestone
Manson, F. M.	Worthington
Mork, D. H.	Jackson
Nusbaum, D. H.	Jackson
Patterson, W. E.	Westbrook
Pertl, A. L.	Windom
Piper, Wm. A.	Mountain Lake
Portman, W. C.	Jackson
Richardson, W. E.	Pipestone
Rose, J. T.	Lakefield
Schutz, E. S.	Mountain Lake
Sherman, C. L.	Luverne
Slater, S. A.	Worthington
Smallwood, J. T.	Worthington
Sogge, L.	Windom
Stanley, C. R.	Worthington
Stevenson, B. M.	Fulda
Stratte, H. C.	Windom
Taylor, Wm. J.	Pipestone
Telford, V. J.	Edgerton
Thorson, E. O.	Luverne
Tiedemann, E. J.	Adrian
Tofte, Josephine	Dawson
Waller, J. D.	Wilmont
Watson, F. G.	Worthington
Watson, S. J.	Worthington
Williams, A. B.	St. Paul
Williams, L. A.	Slayton
Wright, C. O.	Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, monthly.
Annual meeting, April.

President	
Kingsbury, E. M.	Clearwater
Secretary	
Stangl, P. E.	St. Cloud
Beuning, J. B.	Albany
Boehm, J. C.	St. Cloud
Brigham, C. F.	St. Cloud
Buscher, Julius	St. Cloud
Clark, H. B.	St. Cloud
Du Bois, J. A.	Sauk Center
Du Bois, J. F.	Sauk Center
Engstrom, Geo. F.	Belgrade
Fleming, T. N.	St. Cloud
Freeman, W. L.	St. Cloud
Friesleben, Wm.	Sauk Rapids
Gelz, J. J.	St. Cloud
Goehrs, H. W.	St. Cloud
Haberman, E.	Osakis
Hemstead, Werner	St. Cloud
Holdridge, Geo.	Foley
Johnson, Walfred	Sauk Center
Jones, Richard N.	St. Cloud
Kern, M. J.	St. Cloud
Kingsbury, E. M.	Clearwater
Kohler, D. W.	St. Joseph
Koop, S. H.	Richmond
Kuhlman, August	Melrose
Leopard, B. A.	Evanston, Ill.
Lewis, C. B.	St. Cloud
Libert, John N.	St. Cloud
McDowell, Jno. P.	St. Cloud
McKibben, H. E.	St. Cloud
Mahowald, A.	Albany
Meyer, A. A.	Melrose
Moynihan, A. F.	Sauk Center
Myre, C. R.	Paynesville
Rathbun, A. M.	Rice
Rathbun, C. A.	St. Cloud
Richards, W. B.	St. Cloud
Ridgway, Alexander	Belgrade
Rumpf, Wm. H., Jr.	St. Cloud
Schatz, F. J.	St. Cloud
Sherwood, Geo. E.	Kimball
Stangl, Fred	St. Cloud
Stangl, P. E.	St. Cloud
Sutton, Chas. S.	St. Cloud
Wenner, W. T.	St. Cloud
Zachman, A. H.	Melrose

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, odd months, second Tuesday.
Annual meeting, second Tuesday in November.

President	
Nelson, Ernest J.	Owatonna
Secretary	
Smersh, Jerome F.	Owatonna
Berghs, Lyle V.	Owatonna
Dewey, Donald H.	Owatonna
Ertel, Edward Q.	Ellendale
Gault, Charles C.	Owatonna
Hart, Alfred B.*	Owatonna
McIntyre, John A.	Owatonna
Melby, Benedik	Blooming Prairie
Nelson, Ernest J.	Owatonna
Senn, Edward W.	Owatonna
Smersh, Jerome F.	Owatonna
Stewart, Allan B.	Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Crow Wing, Morrison, Cass, Todd, Wadena, Clearwater, Koochiching,
Hubbard, Itasca and Beltrami Counties.
Regular meetings, Spring, Fall, Summer.
Annual meeting, January.

President	
Agnew, Allen T.	International Falls
Secretary	
Van Valkenburg, F. W.	Long Prairie
Agnew, Allen T.	International Falls
Allen, F. H.	Staples
Anderson, C. E.	Brainerd
Badeaux, G. I.	Brainerd
Beise, R. A.	Brainerd
Borreson, Baldwin	Ah-Gwah-Ching
Burns, Herbert A.	Ah-Gwah-Ching
Christie, G. R.	Long Prairie
Christie, R. L.	Long Prairie
Corrigan, J. E.	Spooner
Craig, C. C.	International Falls
Davis, Lloyd T.	Wadena
Davis, Thayer C.	Wadena
Forrest, C. G.	Clearbrook
Gaalaas, A. F.	Minneapolis
Garlock, A. V.	Bemidji
Garlock, Dewitt Howard	Bemidji
Gerber, Milo P.	Brainerd
Ghostley, Mary C.	Puposky

---

*Deceased.

Groschupf, Theo. Paul........Bemidji
Grose, Fredk. N........Clarissa
Hawkinson, John Phillip........Crosby
Hawkinson, L. F........Brainerd
Healy, R. T........Pierz
Hendrickson, Russel R........Wadena
Holst, C. F........Little Falls
Holst, J. B........Little Falls
House, Z. E........Cass Lake
Houston, C. A........Park Rapids
Jacobson, David J........Blackduck
Johnson, E. W........Bemidji
Kelly, B. W........Aitkin
Kenyon, Paul........Wadena
Kerlan, S. Z........Aitkin
Laughlin, J. T........Grey Eagle
Lodmell, Elmer A........Sebeka
McHugh, Roderick F........Aitkin
Marcum, E. H........Bemidji
Miller, W. A........New York Mills
Moyer, Ralph E........Bemidji
Nelson, Nesmith........Brainerd
Ortman, John W........Pierz
Osburn, Burt F........International Falls
Ringles, Otto F........Walker
Roberts, L. M........Little Falls
Rosenfield, A. B........Pequot
Sach-Rowitz, Alvin........McGregor
Shannon, S. S........Crosby
Simons, Edwin J........Swanville
Smith, B. A........Crosby
Smith, E. H........Bemidji
Strader, E. L........Deerwood
Thabes, John Alois, Jr........Brainerd
Thabes, John Alois, Sr........Brainerd
Thabes, J. A........Brainerd
Van Valkenburg, B. F........Long Prairie
Van Valkenburg, F. W........Long Prairie
Watson, A. M........Royalton
Watson, John D........Holdingford
Will, W. W........Bertha
Williams, R. J........Pine River

WABASHA COUNTY MEDICAL SOCIETY

Annual meeting, first Thursday after first Monday in July.

President
Bayley, E. C........Lake City
Secretary
Wilson, W. F........Lake City

Bayley, E. C........Lake City
Bowers, H. F........Lake City
Cochrane, W. J........Lake City
Collins, J. S........Wabasha
Dempsey, D. P........Kellogg
Fleischhauer, D. S........Wabasha
Frost, R. H........Wabasha
Radabaugh, R. C........Hastings
Replogle, W. H........Wabasha
Rudie, C. N........Mazeppa
Slocumb, J. A........Plainview
Stryker, W. B........Plainview
Wilson, W. F........Lake City

WASECA COUNTY MEDICAL SOCIETY

Annual meeting, third Friday in December.

President
O'Hara, J. J........Janesville
Secretary
Saliterman, B. I........Janesville

Bernstein, Wm. C........New Richland
Gallagher, B. J........Waseca
Hagen, H. O........New Richland
McIntire, H. M........Waseca
O'Hara, J. J........Janesville
Saliterman, B. I........Janesville
Swenson, O. J........Waseca
Tavenner, L. J........Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of month, except June, July and August.
Annual meeting, second Tuesday in December.

President
Stuhr, John W........Stillwater

Secretary
Boleyn, E. Sydney........Stillwater

Boleyn, E. Sydney........Stillwater
Haines, J. H........Stillwater
Humphrey, W. R........Stillwater
Josewski, R. J........Stillwater
Kalinoff, D........Stillwater
Petraborg, Harvey T........Stillwater
Poirier, J. A........Forest Lake
Sherman, Carnot H........Philadelphia, Pa.
Strand, E. V........Bayport
Stuhr, J. W........Stillwater
Thompson, V. C........Marine-on-St. Croix

WATONWAN COUNTY MEDICAL SOCIETY

Regular meetings, on call.
Annual meeting, first Thursday in December.

President
McCarthy, W. J........Madelia
Secretary
Grimes, H. B........Madelia

Bergman, O. B........St. James
Bratrude, Earl J........St. James
Bregel, Fred L........St. James
Grimes, Henry B........Madelia
Hagen, Ollie E........Butterfield
Haynes, B. H........Butterfield
McCarthy, W. J........Madelia
Thompson, Albert........St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Traverse, Pope and Stevens Counties.
Regular meetings, January, April and July.
Annual meeting, October.

President
Eberlin, E. A........Glenwood

Secretary
Lindberg, A. L........Wheaton

Arneson, A. I........Starbuck
Bergan, Otto........Clinton
Bolsta, Charles........Ortonville
Caine, Chas. E........Morris
Doleman, N. F........Tintah
Eberlin, E. A........Glenwood
Elsey, J. R........Glenwood
Ewing, C. F........Wheaton
Fitzgerald, E. T........Morris
Giesen, A. F........Starbuck
Judge, W. T........Graceville
Karn, B. R........Ortonville
Leland, J. T........Herman
Lindberg, A. L........Wheaton
Linde, H........Cyrus
Leuty, Amos........Morris
McIver, B. A........Lowry
O'Donnell, D. M........Ortonville
Oliver, C. I........Graceville
Oliver, I. L........Graceville
Pierson, C. M........Wheaton
Ransom, M. L........Hancock
Shelver, H. J........Ortonville
Weir, J. D........Browns Valley

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in April, July and October.
Annual meeting, first Monday in January.

President
Wilson, R. H........Winona

Secretary
Steiner, I. W........Winona

Benoit, F. T........Winona
Dierkes, G. J........Rollingstone
Fetter, Mary........Winona
Heise, W. F. C........Winona
Keyes, E. D........Winona
Keyes, J. D........Winona
Kreuzer, T. C........Winona
Lichtenstein, Hans........Winona
Lindsay, W. V........Winona
McDonnell, C. H........Winona
McLaughlin, E. M........Winona
Mattison, P. A........Winona
Meinert, A. E........Winona
Nauth, W. W........Winona
Neumann, C. A........Winona
Page, R. L........St. Charles
Pritchard, D. B........Winona
Risser, E. D........Winona
Robbins, C. P........Winona
Rollins, F. H........St. Charles
Satterlie, H. W........Lewiston
Schaefer, S........Winona
Steiner, I. W........Winona
Tweedy, G. J........Winona
Walker, G. H........Winona
Wilson, R. H........Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly.
Annual meeting, first Tuesday in October.

President
Catlin, John J........Buffalo
Secretary
Roholt, C. L........Waverly

Catlin, J. J........Buffalo
Clark, H. E........Howard Lake
Ellison, F. E........Monticello
Freed, O. J. R........Cokato
Harriman, L........Howard Lake
Hart, Wm. E........Monticello
Johnson, V. P........Delano
Klaveness, E........St. Paul
Lee, J. L........Watertown
Norris, G. H........Annandale
Peterson, O. L........Cokato
Phillips, A. E........Delano
Ridgway, A. M........Annandale
Roholt, C. L........Waverly
Rousseau, V........Maple Lake
Swezey, B. F........Buffalo

ALPHABETICAL ROSTER

Aanes, A. M.	Red Wing
Abbott, J. S.	St. Paul
Abbott, Wm. P.	Duluth
Aborn, W. H.	Hawley
Abraham, Arden L.	Gibbon
Adams, B. S.	Hibbing
Adams, R. C.	Bird Island
Adams, R. T.	Mantorville
Adams, S. Franklin	Rochester
Adkins, C. M.	Grygla
Adson, A. W.	Rochester
Affeldt, Daniel E.	Kasson
Agnew, Allen T.	International Falls
Ahrens, A. E.	St. Paul
Ahrens, A. H.	St. Paul
Ahrens, R. S.	Minneapolis
Alberts, Max W.	St. Paul
Alexander, Clifford E.	Duluth
Aitkens, H. B.	Le Center
Alden, J. F.	St. Paul
Aldes, Harry	St. Paul
Aldrich, F. H.	Belview
Alexander, F. H.	St. Paul
Aling, C. P.	Minneapolis
Allan, Frank Nathaniel	Rochester
Allen, A. W.	Austin
Allen, Chas. C.	Austin
Allen, Edgar Vannice	Rochester
Allen, F. H.	Staples
Allen, H. W.	Minneapolis
Allen, Mason	St. Paul
Allen, Raymond B.	Rochester
Allen, Roy William	Rochester
Allen, W. A.	Rochester
Allison, R. G.	Minneapolis
Altnow, Hugo O.	Minneapolis
Alvarez, Walter C.	Rochester
Amberg, Samuel	Rochester
Andersen, Arnt G.	Minneapolis
Anderson, Arnold S.	St. Paul
Anderson, C. E.	Brainerd
Anderson, C. M.	Rochester
Anderson, David D.	Minneapolis
Anderson, Edward Dyer	Minneapolis
Anderson, Ernest R.	Minneapolis
Anderson, Frank J.	Minneapolis
Anderson, J. K.	Minneapolis
Anderson, Karl W.	Minneapolis
Anderson, Mark J.	Rochester
Anderson, Norman E.	Harmony
Anderson, R. E.	Willmar
Anderson, Reuben Mauritz	Rochester
Anderson, Richard S.	Rochester
Anderson, S. H.	Red Wing
Anderson, Silas C.	Minneapolis
Anderson, W. S.	Minneapolis
Andreassen, E. C.	Minneapolis
Andrews, J. W.	Mankato
Andrews, R. N.	Mankato
Andrews, R. S.	Minneapolis
Annis, H. B.	Minneapolis
Archibald, Frank M.	Mahnomen
Arends, A. L.	Wright
Arey, H. C.	Excelsior
Arminen, K. V.	Duluth
Armstrong, E. L.	Duluth
Armstrong, J. M.	St. Paul
Arneson, A. I.	Starbuck
Arnold, E. W.	Adrian
Arnson, J. M.	Benson
Arnquist, A. S.	St. Paul
Arvidson, C. G.	Minneapolis
Athens, A. G.	Duluth
Aune, Martin	Minneapolis
Aurand, W. H.	Minneapolis
Aurelius, J. Richards	St. Paul
Avery, J. Fowler	Minneapolis
Ayres, G. T.	Ely
Babcock, F. M.	Northfield
Backe, Edmund	Kenyon
Backus, Andrew S.	St. Paul
Bacon, Knox	San Diego
Bacon, L. C.	St. Paul
Bacon, R. S.	Montevideo
Badeaux, G. I.	Brainerd
Bagley, W. R.	Duluth
Bailey, H. B.	Fairmont
Baken, Melvin P.	Minneapolis
Baker, A. C.	Fergus Falls
Baker, Alfred T.	Minneapolis
Baker, E. L.	Minneapolis
Baker, Harry R.	Hayfield
Baker, Looe	Minneapolis
Baker, Norman H.	Fergus Falls
Bakke, O. H.	Minneapolis
Balcome, F. E.	St. Paul
Balfour, D. C.	Rochester
Ball, R. G.	Rochester
Bank, Harry E.	Minneapolis
Bannick, Edwin G.	Rochester
Barber, J. P.	Minneapolis
Barborka, C. J.	Rochester
Bardon, Richard	Duluth
Bargen, J. Arnold	Rochester
Barker, Nelson Waite	Rochester
Barnes, A. R.	Rochester
Barney, L. A.	Duluth
Barr, W. H.	Wells
Barron, Moses	Minneapolis
Barry, L. W.	St. Paul
Barsness, Nellie	St. Paul
Bartels, E. C.	Rochester
Basinger, H. P.	Windom
Basinger, Harvey R.	Mountain Lake
Bass, G. W.	Minneapolis
Bateman, C. V.	Mountain Lake
Baxter, S. H.	Minneapolis
Bayard, Harry Frederick	Rochester
Bayley, E. C.	Lake City
Beadie, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Beard, Archie H.	Minneapolis
Beard, R. O.	Minneapolis
Beaver, Meredith G.	Rochester
Bedford, E. W.	Minneapolis
Beede, Ethel R.	Faribault
Behmler, Fred W.	Appleton
Beise, R. A.	Brainerd
Beiswanger, R. H.	Wykoff
Bell, C. C.	St. Paul
Bell, E. T.	Minneapolis
Bell, J. W.	Minneapolis
Belote, G. B.	Caledonia
Benedict, E. E.	Minneapolis
Benedict, W. L.	Rochester
Benham, E. W.	Mankato
Benjamin, A. E.	Minneapolis
Benjamin, M. B.	Jasper
Benjamin, W. G.	Pipestone
Benn, F. G.	Minneapolis
Bennion, P. H.	St. Paul
Benoit, F. T.	Winona
Bentley, Norman P.	St. Paul
Berdez, G. L.	Duluth
Bergan, Otto	Clinton
Berge, David O.	Thief River Falls
Berger, Edmund H.	Rochester
Bergh, L. N.	Montevideo
Bergheim, M. C.	Hawley
Berghs, Lyle V.	Owatonna
Bergman, O. B.	St. James
Bergquist, K. E.	Duluth
Berkman, D. M.	Rochester
Berkman, John M.	Rochester
Berkwitz, Nathan J.	Minneapolis
Bernard, B. C.	Thief River Falls
Bernstein, Wm. C.	New Richland
Berrisford, Paul D.	St. Paul
Bertelson, O. L.	Crookston
Bessesen, A. N., Sr.	Minneapolis
Bessesen, Al. N., Jr.	Minneapolis
Bessesen, Daniel H.	Minneapolis
Beuning, J. B.	Albany
Bianco, A. J.	Duluth
Biedermann, Jacob	Thief River Falls
Bigelow, C. E.	Dodge Center
Billings, Ralph E.	Franklin
Binger, H. E.	St. Paul
Binger, Melvin W.	Rochester
Birkeland, Ivar W.	Rochester
Birkland, O. N.	Hibbing
Birnberg, T. L.	St. Paul
Black, Wm.	Mankato
Blacklock, S. S.	Hibbing
Blake, Jas.	Hopkins
Blakely, C. C.	Barnum
Blanchard, H. G.	Fairmont
Blaustone, Henry H.	Minneapolis
Blegen, H. M.	Warren
Bliss, Theodore Liston	Rochester
Bock, R. A.	St. Paul
Bockman, M. W. H.	Minneapolis
Boe, A. M.	Minneapolis
Boeck, William C.	Rochester
Boeckmann, Egil	St. Paul
Boehm, J. C.	St. Cloud
Bofenkamp, F. W.	Luverne
Bohl, George W.	Ada
Bohland, E. H.	St. Paul
Bohland, F. J.	Belle Plaine
Boies, Lawrence R.	Minneapolis
Bole, R. S.	St. Paul
Boleyn, E. S.	Stillwater
Bolsta, Chas.	Ortonville
Boman, P. G.	Duluth
Bong, J. H.	Jasper
Booth, A. E.	Minneapolis
Boothby, W. M.	Rochester
Boquist, E. T. W.	Minneapolis
Boreen, C. A.	Minneapolis
Borg, Joseph F.	St. Paul
Borgeson, Egbert J.	Minneapolis
Borreson, Baldwin	Ah-Gwah-Ching
Bossingham, O. N.	Lake Benton
Bottolfson, B. T.	Moorhead
Bouma, L. R.	St. Paul
Bouman, H. A.	Minneapolis
Bowen, Robert L.	Hibbing
Bowers, H. E.	Lake City
Bowers, J. T.	Thief River Falls
Bowing, H. H.	Rochester
Boyer, S. H.	Duluth
Boynton, Ruth	Minneapolis
Boysen, H.	Welcome
Boysen, Peter	Pelican Rapids
Braasch, Wm. F.	Rochester
Brabec, F. J.	Perham
Bracken, H. M.	Claremont, Calif.
Braden, A. J.	Duluth
Bradley, J. W.	Rochester
Brand, G. D.	St. Paul
Brand, W. A.	Redwood Falls
Branham, D. S.	Albert Lea
Branton, A. F.	Willmar
Branton, B. J.	Willmar
Bratrud, A. F.	Minneapolis
Bratrud, O. Edward	Thief River Falls
Bratrude, E. J.	St. James
Braverman, N. J.	Duluth
Bray, C. W.	Biwabik
Bray, E. R.	St. Paul
Bregel, Fred L.	St. James
Brigham, C. F.	St. Cloud
Brigham, Frank	Watkins
Brimhall, J. B.	St. Paul
Broders, A. C.	Rochester
Brodie, Walter D.	St. Paul
Broker, W. S.	Battle Lake
Brooks, Chas N.	Minneapolis
Brooks, G. F.	St. Paul
Brosseau, J. E.	Argyle
Brown, A. E.	Rochester
Brown, A. H.	Pipestone
Brown, Edgar J.	Minneapolis
Brown, Edw. J.	Minneapolis
Brown, George E.	Rochester
Brown, John C.	St. Paul
Brown, Lyle L.	Crookston
Brown, P. W.	Rochester
Brown, Robert Whitcomb	Rochester
Bruner, Julian M.	Rochester
Brunsting, Louis A.	Rochester
Buck, Fred H.	Shakopee
Buie, L. A.	Rochester
Bulkley, Kenneth	Minneapolis
Bullen, F. W.	Hibbing
Bumpus, H. C.	Rochester
Burch, F. E.	St. Paul
Burfiend, G. H.	St. Paul
Burke, Charles Francis	Rochester
Burkley, George Gregory	Rochester
Burnap, W. L.	Fergus Falls
Burns, F. W.	St. Paul
Burns, Herbert A.	Ah-gwah-ching
Burns, H. D.	Albert Lea
Burns, M. A.	Milan
Burns, R. L.	Two Harbors
Burns, R. M.	St. Paul
Burton, Carl G.	St. Paul
Busher, H.	St. Paul
Buscher, Julius	St. Cloud
Butler, John	Minneapolis
Button, A. J.	Greenbush
Butturff, C. R.	Freeborn
Butz, J. A.	Monterey
Butzer, John A.	Mankato
Buzzelle, L. K.	Minneapolis
Cable, Morris L.	Minneapolis
Cabot, George S.	Minneapolis
Cabot, V. S.	Minneapolis
Cady, L. H.	Minneapolis
Caine, C. E.	Morris
Caldwell, John Mars, Jr.	Rochester
Caldwell, Jas. P.	St. Paul
Caldwell, Kenneth S.	St. Paul
Calhoun, F. W.	Albert Lea
Callahan, F. F.	Pokegama
Callerstrom, G. W.	Minneapolis
Cameron, Isabell	Minneapolis
Cameron, J. A.	St. Paul
Cameron, Markley C., Jr.	Rochester

Camp, John D.	Rochester
Camp, W. E.	Minneapolis
Campbell, J. E.	South St. Paul
Campbell, L. M.	Minneapolis
Campbell, Orwood J.	Minneapolis
Campbell, Robert A.	Minneapolis
Canfield, Wayne W.	Houston
Cannon, Harry	St. Paul
Cantwell, W. F.	International Falls
Cardle, Archibald E.	Minneapolis
Carey, Jas. B.	Minneapolis
Carlaw, C. M.	Minneapolis
Carman, J. E.	Detroit Lakes
Carmichael, Hugh T.	Albany, N. Y.
Caron, Robert P.	Minneapolis
Carroll, Wm. C.	St. Paul
Carstens, C. F.	Hibbing
Carter, Fred G.	St. Paul
Castleton, Kenneth B.	Rochester
Cathcart, E. P.	Rochester
Catlin, John J.	Buffalo
Cavanor, F. T.	Minneapolis
Cervenka, Charles F.	New Prague
Chadbourn, A. G.	Heron Lake
Chamberlain, H. E.	Minneapolis
Chambers, W. C.	Blue Earth
Chapman, C. B.	Rochester
Chapman, T. L.	Duluth
Chatterton, C. C.	St. Paul
Cheleen, S. J.	Minneapolis
Cheney, E. L.	Duluth
Cherry, Chas. H.	Minneapolis
Chesley, A. J.	Minneapolis
Childrey, J. H.	Rochester
Christensen, Eli E.	Rochester
Christensen, E. P.	Two Harbors
Christiansen, A.	St. Paul
Christianson, H. W.	Rochester
Christie, G. R.	Long Prairie
Christie, R. L.	Long Prairie
Christison, J. T.	St. Paul
Chunn, Stanley S.	Lake Wilson
Church, Gerald T.	Rochester
Cilley, Earl I. L.	Rochester
Clark, F. F.	Duluth
Clark, H. B.	St. Cloud
Clark, H. E.	Howard Lake
Clark, H. S.	Minneapolis
Clark, T. C.	Minneapolis
Claydon, Donald R.	Red Wing
Claydon, Howard F.	Zumbrota
Claydon, L. E.	Red Wing
Clement, Gage	Duluth
Clement, J. B.	Lester Prairie
Clifford, F. F.	West Concord
Coakley, Leo P.	Rochester
Cobb, S. G.	St. Paul
Cobb, Willis F.	Lyle
Cochrane, W. J.	Lake City
Cohen, Sumner S.	Oak Terrace
Colby, Woodard	St. Paul
Cole, H. B.	Redwood Falls
Cole, Wallace H.	St. Paul
Coleman, F. B.	Austin
Coleman, Julian H.	Rochester
Collie, H. G.	St. Paul
Collins, A. N.	Duluth
Collins, Donald Clark	Rochester
Collins, H. C.	Duluth
Collins, J. S.	Wabasha
Colvin, A. R.	St. Paul
Combacker, L. C.	Fergus Falls
Comfort, M. W.	Rochester
Condit, W. H.	Minneapolis
Conner, H. M.	Rochester
Conner, Wm. H.	Minneapolis
Connor, C. E.	St. Paul
Cook, Edward N.	Rochester
Cook, Henry Wireman	Minneapolis
Cooke, Harry H.	Rochester
Cooney, H. C.	Princeton
Cooper, M. D.	Winnebago
Corbett, J. Frank	Minneapolis
Corniea, A. D.	Minneapolis
Corr, W. P.	Rochester
Corrigan, J. E.	Spooner
Cosgriff, J. A.	Olivia
Cosman, E. O.	Minneapolis
Cottam, Gilbert G.	St. Paul
Counseller, Virgil S.	Rochester
Countryman, Roger S.	St. Paul
Covell, W. W.	St. Peter
Coventry, W. A.	Duluth
Cowern, E. W.	North St. Paul
Cox, F. W.	Rochester
Crafts, Leo M.	Minneapolis
Craig, C. C.	International Falls
Craig, W. McK.	Rochester
Cranmer, Richard R.	Minneapolis
Cranston, Robert W.	St. Louis Park
Creighton, Ralph H.	Minneapolis
Cremer, M. H.	Red Wing
Crenshaw, J. L.	Rochester
Cress, E. E.	Boyd
Cress, P. J.	Ellsworth
Crewe, J. E.	Rochester
Crisp, Norman W.	Rochester
Critchfield, L. R.	St. Paul
Cronwell, B. J.	Austin
Crow, E. R.	Arlington
Crume, Geo. P.	Minneapolis
Crump, J. W.	St. Paul
Culligan, J. M.	St. Paul
Culligan, L. C.	Mendota
Cummings, Damon Ward	Hibbing
Curtin, John F.	Minneapolis
Cutts, George	Minneapolis
Cutts, Rollin E.	Rochester
Dack, Lloyd G.	St. Paul
Dady, Elmer E.	Minneapolis
Dahl, Elmer O.	Minneapolis
Dahl, G. A.	Mankato
Dahl, John A.	Minneapolis
Dahlin, I. T.	Aurora
Dahlstrom, A. W.	Minneapolis
Daignault, Oscar	Benson
Daniel, Donald H.	Minneapolis
Daniel, Lewis M.	Minneapolis
Daniels, Harry A.	Rochester
Daniels, J. W.	St. Peter
Daniels, L. E.	Rochester
Danielson, K. A.	Litchfield
Darling, J. B.	St. Paul
D'Arms, Harry Lee	Hector
Dart, Leslie O.	Minneapolis
Daugherty, E. B.	St. Paul
Daugherty, L. E.	St. Paul
Davis, Austin Clifford	Rochester
Davis, B. F.	Duluth
Davis, F. U.	Faribault
Davis, Herbert	St. Paul
Davis, I. Grant	Rushford
Davis, Lloyd Thomas	Wadena
Davis, Thayer Clinton	Wadena
Davis, William	St. Paul
Davison, H. L.	Rochester
Dawley, Walter Averill	Rochester
De Boer, Hermanus	Edgerton
De Carle, Donald W.	Rochester
Decker, Fred Henry	Rochester
Dedolph, Karl	St. Paul
Delmore, J. L.	Roseau
Dempsey, D. P.	Kellogg
Denman, A. V.	Mankato
Derauf, B. I.	St. Paul
Desjardins, Arthur U.	Rochester
Devereaux, T. J.	Wayzata
Dewar, J. E.	Minneapolis
Dewey, Donald H.	Owatonna
Deziel, G.	Minneapolis
Dickson, Thos. H., Jr.	St. Paul
Diehl, Harold S.	Minneapolis
Dierkes, Gustav J.	Rollingstone
Diessner, H. D.	Minneapolis
Ditmeier, L. M. Gerber	Jasper
Dittman, Geo. C.	St. Paul
Dixon, Claude F.	Rochester
Dixon, Robert Kenneth	Rochester
Dodge, F. A.	Le Sueur
Doering, R. E.	Minneapolis
Dohm, A. J.	St. Paul
Dolan, C. P.	Worthington
Dolder, F. C.	Eyota
Doleman, Nathan F.	Tintah
Doms, H. C.	Slayton
Donald, Joseph Marion	Rochester
Donaldson, C. A.	Mesa, Arizona
Donohue, Philip F.	St. Paul
Doolittle, L. E.	Duluth
Dordal, J.	Sacred Heart
Dorge, Richard I.	Minneapolis
Dornblaser, H. Bright	Minneapolis
Dorsey, G. C.	Minneapolis
Down, Howard Ivan	Rochester
Dowswell, W. J.	Kerkhoven
Doxey, G. L.	Minneapolis
Doyle, George C.	Duluth
Doyle, J. B.	Rochester
Doyle, L. O.	Minneapolis
Drake, Carl B.	St. Paul
Drake, C. R.	Minneapolis
Drake, F. A.	Lanesboro
Dredge, H. P.	Sandstone
Dreisbach, N.	Minneapolis
Drenning, F. C.	Duluth
Drips, D. G.	Rochester
Drill, Herman E.	Battle Lake
Droegemueller, E. H.	Rochester
Drought, W. W.	Fergus Falls
Dubbe, F. H.	New Ulm
Du Bois, J. A.	Sauk Center
Du Bois, J. F.	Sauk Center
Dudley, J. H.	Windom
Duff, Edwin R.	Minneapolis
Dugan, Lawrence F.	Faribault
Dukelow, Donald A.	Rochester
Dulude, Stephane	Dassel
Duncan, Henry	Marietta
Dungay, Neil S.	Northfield
Dunlap, E. H.	Minneapolis
Dunlap, H. F.	Rochester
Dunlop, Alex	Crookston
Dunn, Geo. Robt	Minneapolis
Dunn, J. N.	St. Paul
Dunne, Gerald P.	St. Paul
Durgin, F. L.	Winnebago
Duryea, Marbry	Minneapolis
Dutton, C. E.	Minneapolis
Dworsky, Samuel D.	Minneapolis
Dysterheft, Adolph F.	Gaylord
Earl, George A.	St. Paul
Earl, Robert O.	St. Paul
Eberlin, E. A.	Glenwood
Eby, C. B.	Spring Valley
Eckman, P. F.	Duluth
Eckstein, A. W.	Mankato
Edlund, G.	St. Paul
Edstrom, Henry	Crookston
Edward, George	Canton
Edwards, Gordon Clarence	Grove City
Edwards, Ralph T.	Elysian
Egilsrud, Kristian	Minneapolis
Ehrenberg, C. J.	Minneapolis
Ehrlich, S. Paul	Minneapolis
Eisenstadt, David H.	Minneapolis
Eitel, Geo. D.	Minneapolis
Ekblad, J. W.	Duluth
Eklund, E. J.	Norwood
Eklund, Wm. J.	Duluth
Elias, F. J.	Duluth
Ellingson, A. R.	Detroit Lakes
Ellison, David E.	Minneapolis
Ellison, Frank E.	Monticello
Elsey, J. R.	Glenwood
Ely, O. S.	South St. Paul
Emerson, E. C.	St. Paul
Emmerson, W. S.	Mayer
Emmons, W. F.	Rochester
Emond, Albert J.	Minneapolis
Endress, E. K.	St. Paul
Engberg, E. J.	St. Paul
Engh, Sigfred	Jackson
Engstrand, Oscar J.	Warren
Engstrom, Frederick A.	Wanamingo
Engstrom, Geo. F.	Belgrade
Eppard, R. M.	Cloquet
Erb, F. A.	Minneapolis
Erdmann, C. A.	Minneapolis
Erickson, Reuben Ferd	Minneapolis
Ericson, J. G.	Minneapolis
Ericson, Reinhold Milton	Minneapolis
Ericson, Swan	Le Sueur
Ernest, G. C.	St. Paul
Ertel, E. Q.	Ellendale
Eshelby, E. C.	St. Paul
Esser, John	Perham
Estrem, C. O.	Fergus Falls
Estrem, T. A.	Hibbing
Eusterman, G. B.	Rochester
Evans, Edward T.	Minneapolis
Evans, Vernon L.	Rochester
Evans, R. D.	Minneapolis
Evarts, Arrah B.	Rochester
Everlof, J. L.	Minneapolis
Ewbank, John Nelson	Blooming Prairie
Ewens, H. B.	Virginia
Ewing, C. F.	Wheaton
Exley, E. W. F.	Minneapolis
Fahey, E. W.	St. Paul
Fahr, Geo. Edmeston	Minneapolis
Fansler, W. A.	Minneapolis
Farabaugh, Chas.	Minneapolis
Farr, R. E.	Minneapolis
Farrell, H. J.	Rochester
Farrish, R. C.	Sherburn
Faust, Louis Sanders	Rochester
Fauster, John Ulrich, Jr.	Rochester
Fawcett, A. Maxwell	Renville
Fawcett, C. E.	Stewartville
Fawcett, Keith R.	Duluth
Fenger, E.	Oak Terrace
Ferguson, J. C.	St. Paul
Ferreira, Gideon J.	Duluth
Fesler, Harold H.	St. Paul
Fetter, Mary	Winona
Figi, F. A.	Rochester
Fiksdal, M. J.	Willmar
Fink, Leo. W.	Minneapolis
Fink, Walter H.	Minneapolis
Finney, W. P.	Rochester
Fischer, H. P.	Shakopee
Fischer, Mario McC.	Duluth
Fischer, P. M.	Shakopee
Fitzgerald, D. F.	Minneapolis

Fitzgerald, E. T.	Morris
Fjeldstad, C. Alford	Minneapolis
Fjellman, R. C.	Minneapolis
Flagstad, A. E.	Minneapolis
Fleischhauer, D. S.	Wabasha
Fleming, T. N.	St. Cloud
Flemming, A. S.	Minneapolis
Flinn, B. P.*	Redwood Falls
Flinn, T. E.	Redwood Falls
Flom, A. O.	Chisago City
Flower, W. Z.	Minneapolis
Fogarty, Chas. W.	St. Paul
Foley, F. E. B.	St. Paul
Folken, F. G.	Albert Lea
Forbes, Robert S.	Duluth
Ford, Burton C.	Marshall
Ford, Frances A.	Rochester
Forrest, C. G.	Clearbrook
Forster, W. L.	Hibbing
Fortin, Harry J.	Rochester
Fortney, G. O.	Zumbrota
Foshager, Henry T.	Clara City
Fowler, L. H.	Minneapolis
Fox, John M.	Minneapolis
Franchere, F. W.	Lake Crystal
Francis, David W.	Morristown
Fredericks, George M.	Minneapolis
Frederickson, Guy U. Y.	Lake Lillian
Fredrickson, Alice C.	Lake Lillian
Freeborn, J. A.	Fergus Falls
Freed, O. J. R.	Cokato
Freeman, C. D.	St. Paul
Freeman, Geo. H.	St. Peter
Freeman, J. P.	Albert Lea
Freeman, W. L.	St. Cloud
Freligh, W. P.	Albert Lea
French, H. S.	Duluth
Friedell, A.	Minneapolis
Friesleben, Wm.	Sauk Rapids
Fricke, Robert Elmer	Rochester
Frisch, F. P.	Willmar
Fritsche, Albert	New Ulm
Fritsche, Carl J.	New Ulm
Fritsche, L. A.	New Ulm
Froehlich, H. W.	Thief River Falls
Frost, E. H.	Willmar
Frost, Russell H.	Wabasha
Fugina, George R.	Mankato
Fulcher, Oscar Hugh	Rochester
Fulton, J. F.	St. Paul
Funk, Victor K.	Oak Terrace

Gaalaas, A. F.	Minneapolis
Gaarde, F. W.	Rochester
Gager, E. C.	St. Paul
Gaines, E. C.	Buffalo Lake
Gallagher, B. J.	Waseca
Gamble, J. W.	Albert Lea
Gamble, P. M.	Albert Lea
Gamble, R. M.	Albert Lea
Garbrecht, Arthur	St. Paul
Gardiner, D. G.	St. Paul
Gardner, Edwin L.	Minneapolis
Gardner, V. H.	Fairmont
Garlock, A. V.	Bemidji
Garlock, Dewitt Howard	Bemidji
Gault, C. C.	Owatonna
Geer, Everett K.	St. Paul
Gehlen, J. N.	St. Paul
Geist, Emil S.	Minneapolis
Geist, George A.	St. Paul
Gelz, J. J.	St. Cloud
Gerber, Milo P.	Brainerd
Germo, Chas.	Balaton
Ghent, C. Harry	St. Paul
Ghent, M. M.	St. Paul
Ghormley, Ralph K.	Rochester
Ghostley, Mary C.	Puposky
Gibbons, Francis C.	Comfrey
Giere, E. O.	Minneapolis
Giere, J. C.	Minneapolis
Giere, Richard	Minneapolis
Giere, S. W.	Benson
Giesen, A. F.	Starbuck
Giessler, Paul W.	Minneapolis
Giffin, H. Z.	Rochester
Gilfillan, J. S.	St. Paul
Gilles, F. L.	Minneapolis
Gillespie, James B.	Rochester
Gillespie, M. G.	Duluth
Gillespie, N. H.	Duluth
Gingold, Benjamin A.	Minneapolis
Ginsberg, Wm.	St. Paul
Girvin, R. B.	Minneapolis
Goblirsch, A. P.	Sleepy Eye
Goeckerman, W. H.	Rochester
Goehrs, H. W.	St. Cloud
Goldberg, Samuel Louis	Rochester
Golden, C. M.	Tyler
Goltz, E. V.	St. Paul
Goodman, C. E.	Virginia
Gordon, Geo. J.	Minneapolis
Gosslee, G. L.	Moorhead
Graham, A. Stephens	Rochester
Graham, David	Duluth
Graham, R. D.	Duluth
Graham, Robert	Duluth
Grant, H. W.	St. Paul
Gratzek, Frank R.	Minneapolis
Gratzek, Thos.	St. Paul
Graves, W. N.	Duluth
Grawn, F. A.	Duluth
Gray, F. D.	Marshall
Gray, Howard Kramer	Rochester
Green, E. K.	Minneapolis
Greene, Carl Hartley	Rochester
Greene, H. Harvey	Austin
Greene, W. P.	Minneapolis
Greisheimer, Esther M.	Minneapolis
Grimes, Allen Evans, Jr.	Rochester
Grimes, H. B.	Madelia
Grimes, Marian	Minneapolis
Grinnell, W. B.	Preston
Gronvall, Paul R.	Minneapolis
Groschupf, Theo. Paul	Bemidji
Grose, Fredk. Nicolay	Clarissa
Gruenhagen, Arnold P.	St. Paul
Gullixon, A.	Albert Lea
Gully, Raymond J.	St. Peter
Gunderson, Nels A.	Minneapolis
Gunderson, R. M.	Lake Park
Gustafson, H. T.	Minneapolis

Habein, Harold C.	Rochester
Haberman, E.	Osakis
Hacking, Frank H.	Minneapolis
Haddow, N. W.	Minneapolis
Haessly, S. B.	Faribault
Hagaman, Geo. K.	St. Paul
Hagen, G. L.	Minneapolis
Hagen, H. O.	New Richland
Hagen, O. E.	Butterfield
Hagen, Olaf J.	Moorhead
Haggard, G. D.	Minneapolis
Haines, J. H.	Stillwater
Haines, S. F.	Rochester
Halgren, Harry A.	Watertown
Hall, Andrea E.	Virginia
Hall, A. R.	St. Paul
Hall, Henry H.	St. Paul
Hall, J. M.	Minneapolis
Hall, S. S.	Minneapolis
Hallenbeck, D. F.	Rochester
Hallberg, C. A.	Minneapolis
Halloran, Walter	Jackson
Halpin, Jos. Ephraim	Rush City
Hamilton, A. S.	Minneapolis
Hamlin, George B.	Minneapolis
Hamm, Frank C.	Rochester
Hammermeister, Theodore F.	New Ulm
Hammes, E. M.	St. Paul
Hammond, A. J.	Minneapolis
Hammond, J. F.	St. Paul
Haney, C. L.	Duluth
Hanlon, Frank Robert	Rochester
Hannah, Hewitt B.	Minneapolis
Hansen, Erling	Minneapolis
Hansen, Olga Sophie	Minneapolis
Hanson, A. M.	Faribault
Hanson, Edwin C.	Faribault
Hanson, H. James	Minneapolis
Hanson, H. V.	Minneapolis
Hardeman, Daniel Robt., Jr.	Rochester
Hare, E. R.	Minneapolis
Harmeier, John Watson	Rochester
Harmon, G. E.	St. Paul
Harper, Frederick Richard	Rochester
Harriman, L.	Howard Lake
Harrington, C. D.	Minneapolis
Harrington, F. E.	Minneapolis
Harrington, S. Wm.	Rochester
Harris, Carl Norman	Hibbing
Harris, Milo T.	Rochester
Harrison, Percy Willard	Rochester
Hart, Alfred B.	Owatonna
Hart, William E.	Monticello
Hartfiel, Wm. F.	St. Paul
Hartley, E. C.	St. Paul
Hartman, Howard Russell	Rochester
Hartzell, Thos. B.	Minneapolis
Haskell, A. D.	Alexandria
Hassett, Roger G.	Mankato
Hastings, D. R.	Minneapolis
Hatch, W. E.	Duluth
Hathaway, S. J.	Proctor
Hauge, Malvin I.	Clarkfield
Hauge, M. M.	Clarkfield
Hauser, Victor Paul	St. Paul
Havens, Fred Z.	Rochester
Havens, John G. W.	Austin
Haverfield, Addie R.	Minneapolis
Hawkins, V. J.	St. Paul
Hawkinson, John Philip	Crosby
Hawkinson, L. F.	Brainerd
Hawkinson, R. P.	Minneapolis
Hayes, J. M.	Minneapolis
Hayes, M. F.	Nashwauk
Haynes, A. L.	Faribault
Haynes, B. H.	Butterfield
Haynes, M. H.	Duluth
Hazen, S. Frank	Rochester
Head, Douglas P.	Minneapolis
Head, G. D.	Minneapolis
Healy, R. T.	Pierz
Hearn, Wm. O.	Minneapolis
Heath, A. C.	St. Paul
Hebeisen, M. B.	Carver
Heck, Frank Joseph	Rochester
Heck, Wm. W.	St. Paul
Hedback, A. E.	Minneapolis
Hedding, J. A.	Minneapolis
Hedenstrom, Frank G.	St. Paul
Hedenstrom, Louis Henry	Cambridge
Hegge, O. H.	Austin
Hegge, R. S.	Austin
Heiberg, E. A.	Fergus Falls
Heim, Russell R.	Minneapolis
Heise, W. F. C.	Winona
Heimark, J. H.	Moorhead
Heimark, J. J.	Fairmont
Heimark, O. E.	Duluth
Heimdal, Clarence O.	Rochester
Helk, H. H.	Minneapolis
Helland, G. M.	Spring Grove
Helland, J. W.	Spring Grove
Helmholz, H. F.	Rochester
Hempstead, B. E.	Rochester
Hempstead, Werner	St. Cloud
Hench, Philip S.	Rochester
Henderson, A. J.	Kiester
Henderson, M. S.	Rochester
Hendrickson, J. F.	Minneapolis
Hendrickson, Russell R.	Wadena
Hengstler, Wm. Howard	St. Paul
Henney, Wm. H.	McIntosh
Henriksen, H. G.	Elko
Henry, C. E.	Minneapolis
Henry, Myron O.	Minneapolis
Hensel, C. N.	St. Paul
Henslin, A. E.	LeRoy
Herbert, Willis Leo	Maynard
Herbolsheimer, A. J.	Minneapolis
Herbst, Wm. P.	Minneapolis
Herman, Arthur L.	Minneapolis
Hermanson, Peter E.	Hendricks
Herrmann, Edgar T.	St. Paul
Hertel, G. E.	Austin
Hesselgrave, S. S.	St. Paul
Hewitt, Edith Swartwout	Rochester
Heyerdale, O. C.	Rochester
Hiebert, J. P.	Minneapolis
Hielscher, Helen H.	Mankato
Hielscher, Julian A.	Mankato
Higbee, Paul A.	Minneapolis
Higgins, J. H.	Minneapolis
Hilbert, Eunice	Minneapolis
Hilding, Anderson C.	Rochester
Hilger, A. W.	St. Paul
Hilger, D. D.	St. Paul
Hilger, J. M.	Iona
Hilger, L. A.	St. Paul
Hill, Eleanor J.	Minneapolis
Hill, Frederick E.	Duluth
Hillyard, Lorin Victor	Rochester
Hilton, J. M.	Rochester
Hiniker, Louis P.	St. Paul
Hiniker, Peter J.	Le Sueur
Hirschboeck, F. J.	Duluth
Hirschfelder, A. D.	Minneapolis
Hirschfield, Adolph	Minneapolis
Hirschfield, M. S.	Duluth
Hirshfield, F. R.	Minneapolis
Hitchings, W. S.	Lakefield
Hoaglund, Arthur W.	Minneapolis
Hobbs, C. A.	Minneapolis
Hochfilzer, J. J.	St. Paul
Hodapp, R. J.	Willmar
Hodge, S. V.	Minneapolis
Hodgson, H. H.	Crookston
Hoeper, Philip G. E.	Litchfield
Hoff, Alfred	St. Paul
Hoffman, Max H.	St. Paul
Hoidale, A. D.	Tracy
Hoiland, A. S.	Minneapolis
Holbrook, J. S.	Mankato
Holcomb, J. T.	St. Paul
Holcomb, O. W.	St. Paul
Holderman, J. W.	Duluth
Holdridge, Geo.	Foley
Holen, T.	Minneapolis
Holl, P. M.	Minneapolis
Holland, Wilbur Wallace	Rochester
Hollands, W. H.	Fisher
Holm, C. E.	Philadelphia, Pa.
Holm, H. H.	Glencoe
Holmberg, L. J.	Canby
Holmes, A. E.	Rush City

---

*Deceased.

Holmstrom, C. H.	Warren
Holst, C. F.	Little Falls
Holst, J. B.	Little Falls
Holt, John E.	St. Paul
Holt, Wm. B.	Minneapoils
Holtan, Theodore	Waterville
Holte, H.	Crookston
Horton, Bayard T.	Rochester
Houkom, Bjarne	Fergus Falls
House, Z. E.	Cass Lake
Houston, C. A.	Park Rapids
Hovde, Rolf	Winthrop
Howard, M. I.	Mankato
Howard, William H.	Minneapolis
Howard, W. S.	St. Paul
Huenekens, E. J.	Minneapolis
Huffington, H. L.	Mankato
Hughes, Louis D.	Minneapolis
Hullsiek, H. E.	St. Paul
Hullsiek, Richard B.	St. Paul
Hultkrans, Joel C.	St. Paul
Hultkrans, R. E.	Minneapolis
Humphrey, Arthur Allan	Rochester
Humphrey, E. W.	Moorhead
Humphrey, W. R.	Stillwater
Hunt, F. N.	Fairmont
Hunt, H. E.	St. Paul
Hunt, R. C.	Fairmont
Hunte, A. F.	Bylos, Arizona
Hurd, Annah	Minneapolis
Hurt, Algernon Smith, Jr.	Rochester
Hurt, Holcombe Harris	Rochester
Huseby, H. W.	Floodwood
Hutchinson, Charles J.	Minneapolis
Hutchinson, Henry	New London
Huxley, Frederick R.	Faribault
Hyde, Theodore Lincoln	Rochester
Hymes, Chas.	Minneapolis
Hynes, James	Minneapolis
Hynes, John E.	Minneapolis
Iber, Frank C.	Rochester
Ide, A. W.	St. Paul
Ikeda, Kano	St. Paul
Imes, Pat R.	Rochester
Irwin, Alex F.	Minneapolis
Jackson, C. M.	Minneapolis
Jacobs, A. C.	Elmore
Jacobs, John C.	Willmar
Jacobson, Clarence	Chisholm
Jacobson, David J.	Blackduck
Jacquot, G. L.	Marshall
Jamieson, Earl	Walnut Grove
Jennings, Frank L.	Oak Terrace
Jennings, Mary H.	Minneapolis
Jensen, A. H.	Hutchinson
Jensen, Harry	Minneapolis
Jensen, Louis C.	Minneapolis
Jensen, M. J.	Minneapolis
Jensen, T. J.	Duluth
Jensen, Herman H.	Atwater
Johnson, A. E.	Minneapolis
Johnson, A. E.	Red Wing
Johnson, Andrew Richard	Eveleth
Johnson, Asa M.	St. Paul
Johnson, C. M.	Dawson
Johnson, Ellsworth	Rochester
Johnson, E. W.	Bemidji
Johnson, H. P.	Fairmont
Johnson, Hans	Kerkhoven
Johnson, Hartland C.	St. Paul
Johnson, H. M.	Dawson
Johnson, H. W. E.	Rochester
Johnson, James A.	Minneapolis
Johnson, J. Arthur	St. Paul
Johnson, Nimrod A.	Minneapolis
Johnson, Norman	Minneapolis
Johnson, O. H.	Echo
Johnson, O. V.	Fergus Falls
Johnson, R. A.	Minneapolis
Johnson, Ray G.	St. Paul
Johnson, Selmer M.	Minneapolis
Johnson, T. H.	St. Paul
Johnson, Verner P.	Delano
Johnson, Walfred	Sauk Center
Johnson, Walter Royle	Rochester
Johnson, Wm. E.	Caledonia
Jones, A. W.	Red Wing
Jones, D. C.	St. Paul
Jones, E. M.	St. Paul
Jones, G. M.	Minneapolis
Jones, H. W.	Minneapolis
Jones, Richard N.	St. Cloud
Jones, William R.	Minneapolis
Jordan, Ferdinand Michael	Rochester
Jordan, Lewis S.	Granite Falls
Josewski, R. J.	Stillwater
Joyce, George Leo	Stewartville
Joyce, G. T.	Rochester
Judd, E. S.	Rochester
Judge, Walter T.	Graceville
Juergens, H. M.	Belle Plaine
Juliar, R. O.	St. Clair
Just, Herman J.	Lafayette
Kaasa, L. J.	Albert Lea
Kadesky, David	St. Paul
Kahala, Arthur	Crookston
Kalinoff, D.	Stillwater
Kamman, Gordon R.	St. Paul
Kamp, B. A.	Albert Lea
Kannary, E. L.	St. Paul
Kanne, C. W.	Faribault
Karn, B. R.	Ortonville
Kaufman, Wm. C.	Appleton
Kegaries, Donald L.	Rochester
Keith, H. M.	Rochester
Keith, N. M.	Rochester
Kelby, G. M.	Minneapolis
Kelling Louis F.	Lakefield
Kellum, E. L.	Rochester
Kelly, B. W.	Aitkin
Kelly, John V.	St. Paul
Kelly, Paul H.	St. Paul
Kelsey, C. G.	Hinckley
Kemp, A. F.	Mankato
Kemp, M. W.	Fergus Falls
Kendahl, A. M.	Jasper
Kenefick, E. V.	St. Paul
Kennedy, C. C.	Minneapolis
Kennedy, Jane F.	Minneapolis
Kennedy, Roger L. J.	Rochester
Kennedy, R. Roy	Minneapolis
Kennedy ,W. A.	St. Paul
Kenny, H. F.	St. Paul
Kenyon, Paul	Wadena
Kepler, Edwin John	Rochester
Kerlan, M.	New York City
Kerlan, S. Z.	Aitkin
Kern, M. J.	St. Cloud
Kernohan, James Watson	Rochester
Kerschbaumer, Louisa	St. Peter
Kesting, Herman	St. Paul
Keyes, E. D.	Winona
Keyes, J. D.	Winona
Kibbe, O. A.	Minneapolis
Kiefer, M. A.	Sleepy Eye
Kierland, P. E.	Alexandria
Kiesling, I. H.	Nashwauk
Kilbourne, A. F.	Rochester
Kilbride, E. A.	Worthington
Kilbride, J. S.	Canby
Kilgore, G. L.	Rochester
King, George L.	St. Paul
King, Harry T.	Minneapolis
King, W. S.	Eveleth
King, Z. P.	St. Paul
Kingsbury, E. M.	Clearwater
Kinsella, Thomas J.	Oak Terrace
Kintner, Arthur Ruel	Rochester
Kirk, G. P.	East Grand Forks
Kirklin, B. R.	Rochester
Kirklin, Oren Leslie	Rochester
Kistler, A. J.	Minneapolis
Kistler, A. S.	St. Paul
Kistler, C. M.	Minneapolis
Kittelson, T. N.	Fergus Falls
Klaveness, E.	St. Paul
Klein, Harry	Duluth
Klein, H. N.	St. Paul
Klima, W. W.	Stewart
Kliman, F. E.	Duluth
Knapp, F. N.	Duluth
Knauff, M. K.	St. Paul
Knight, Ralph T.	Minneapolis
Knight, Ray Roberts	Minneapolis
Koch, John Charles	Minneapolis
Koenigsberger, Charles	Mankato
Koepcke, Gerald M.	Minneapolis
Kohlbry, C. O.	Duluth
Kohler, D. W.	St. Joseph
Kohler, G. A.	Minneapolis
Kolars, J. J.	Le Center
Koller, Herman M.	Minneapolis
Koller, L. R.	Minneapolis
Kolset, Karl D.	Sanborn
Kooiker, Herman J.	Milaca
Koop, S. H.	Richmond
Kotchevar, F. R.	Eveleth
Kraft, Peter	Duluth
Krantz, C. I.	Duluth
Kremer, Walter J.	Minneapolis
Kreuzer, Titus C.	Winona
Kriedt, Daniel	Minneapolis
Kucera, Frank Jos.	Hopkins
Kucera, Wm. J.	Minneapolis
Kuhlman, August	Melrose
Kullman, Harold John	Rochester
Kuth, J. R.	Duluth
Kvitrud, G.	St. Paul
Laird, A. T.	Nopeming
Lajoie, John M.	Minneapolis
Lamont, John G.	Nopeming
Lane, Laura A.	Northfield
Lang, Valorus Frederick	Rochester
Langenderfer, F. V.	St. Paul
Langhoff, A. H.	Glencoe
Lannin, J. C.	Mabel
Lapierre, A. P.	Minneapolis
Lapierre, J. T.	Minneapolis
Larsen, C. L.	St. Paul
Larsen, O. O.	Detroit Lakes
Larson, A. L.	Detroit Lakes
Larson, Clarence M.	Minneapolis
Larson, Lawrence M.	Rochester
Laughlin, J. T.	Grey Eagle
Lawrent, A. A.	Minneapolis
LaVake, R. T.	Minneapolis
Lax, Morris H.	St. Paul
Lazar, H. L.	Minneapolis
Leahy, Bartholomew	St. Paul
Learmonth, James R.	Rochester
Leavenworth, Richard O.	St. Paul
Leavitt, H. H.	Minneapolis
Lebowski, Joseph A.	Minneapolis
Leck, Clifford C.	Austin
Leddy, Eugene T.	Rochester
Lee, H. M.	Minneapolis
Lee, J. L.	Watertown
Lee, Thos. G.	Minneapolis
Lee, W. A.	Fergus Falls
Lee, Walter N.	Madison
Leggett, Elizabeth Ann	Minneapolis
Leibold, H. H.	Parkers Prairie
Leitch, Archibald	St. Paul
Leitch, N. M.	Warroad
Leland, Harold R.	Minneapolis
Leland, John T.	Herman
Leland, M. N.	Minneapolis
Lemon, W. S.	Rochester
Lenander, Melvin E.	St. Peter
Lende, Norman	Faribault
Lenont, C. B.	Virginia
Leonard, Gilbert, John	St. Paul
Leonard, L. J.	Minneapolis
Lepak, F. J.	Duluth
Lepak, John A.	St. Paul
Leopard, Brand A.	Evanston, Ill.
Lerch, William	Cable, Wis.
Leuty, Amos	Morris
Levin, Bert	St. Paul
Levine, N. M.	Minneapolis
Lewis, A. J.	Henning
Lewis, C. B.	St. Cloud
Lewis, W. W.	St. Paul
Lexa, F. J.	Lonsdale
Libert, John N.	St. Cloud
Lichtenstein, H.	Winona
Lick, C. Louis	St. Paul
Liedloff, A. G.	Mankato
Liffrig, W. W.	Goodhue
Lillehei, E. J.	Minneapolis
Lillie, H. I.	Rochester
Lillie, W. I.	Rochester
Lima, Ludvig	Montevideo
Lind, C. J.	Minneapolis
Lindahl, Merlyn J.	Winthrop
Lindberg, A. L.	Wheaton
Linde, Herman	Cyrus
Lindquist, R. H.	Minneapolis
Lindsay, W. V.	Winona
Lineberry, E. D.	Rochester
Linner, H. P.	Minneapolis
Linton, W. B.	Minneapolis
Litman, Samuel N.	Duluth
Little, W. J.	St. Paul
Litzenberg, J. C.	Minneapolis
Lloyd, H. J.	Mankato
Lochead, Daniel Cameron	Rochester
Locken, O. E.	Crookston
Lodmell, Elmer A.	Sebeka
Logan, A. H.	Rochester
Logan, F. W.	Blue Earth
Logefeil, Rudolph C.	Minneapoils
Lommen, A. P.	Lanesboro
Lommen, P. A.	Austin
Loney, W. R. R.	Rochester
Long, Jesse	Minneapolis
Loomis, E. A.	Minneapolis
Love, Fred A.	Carlos
Love, J. G.	Rochester
Lowe, Earl R.	South St. Paul
Lowe, Thos.	Pipestone
Lowe, Thomas A.	South St. Paul
Luden, Georgine	Victoria, B. C., Can.
Luedtke, G. H.	Fairmont
Lum, C. E.	Nisswa
Lundgren, A. C.	Minneapolis
Lundholm, A. M.	St. Paul
Lundquist, E. F.	Minneapolis
Lundy, John S.	Rochester
Lynch, M. J.	Minneapolis
Lynde, Orrin G.	Thief River Falls
Lyon, E. P.	Minneapolis
Lyon, J. D.	Minneapolis
Lysne, Henry	Minneapolis

McBeath, Ewing C.	New York City
McBroom, D. E.	Cambridge
McCarthy, Donald	Minneapolis
McCarthy, W. J.	Madelia
McCarthy, W. R.	St. Paul
McCartney, James S.	Minneapolis
McCarty, P. Dean	Ely
McCarty, Ray Bardwell	Rochester
McCaughan, John, Milton	Rochester
McClanahan, J. H.	White Bear
McClanahan, T. S.	White Bear
McCioud, C. N.	St. Paul
McComb, C. F.	Duluth
McCoy, Mary K.	Duluth
McCrea, James M.	Fulda
McCuskey, Charles F.	Rochester
McDaniel, Orianna	Minneapolis
McDaniel, S. P.	Mountain Iron
McDonald, A. L.	Duluth
McDonell, C. H.	Winona
McDowell, J. P.	St. Cloud
McEachran, A.	Minneapolis
McFarland, A. H.	Minneapolis
McGandy, R. F.	Minneapolis
McGeary, Geo. E.	Minneapolis
McGiffert, E. N.	Duluth
McGroarity, J. J.	Easton
McGuigan, H. T.	Red Wing
McHaffie, O. L.	Duluth
McHugh, Roderick F.	Aitkin
McInerny, Maurice	Minneapolis
McIntire, H. M.	Waseca
McIntyre, Geo.	Minneapolis
McIntyre, John A.	Owatonna
McIver, B. A.	Lowry
McKaig, Carle B.	Pine Island
McKechnie, Wilfred	St. Peter
McKenna, J. K.	Austin
McKeon, James	St. Paul
McKeon, J. O.	Montgomery
McKeon, Owen	St. Paul
McKeown, E. G.	Pipestone
McKibben, H. E.	St. Cloud
McKinlay, C. A.	Minneapolis
McKinley, J. C.	Minneapolis
McKinney, F. S.	Minneapolis
McLaren, Jennette M.	St. Paul
McLane, Evelyn Gruhlke	Sleepy Eye
McLane, William O.	Sleepy Eye
McLaughlin, E. M.	Winona
McMahon, Leo H.	Breckenridge
McNevin, C. F.	St. Paul
McNutt, John R.	Duluth
McPheeters, H. O.	Minneapolis
McQuiston, James Stuart	Rochester

Macbeth, J. L.	St. Clair
MacDonald, A. E.	Minneapolis
MacDonald, D. A.	Minneapolis
MacDonald, Irving C.	Minneapolis
Macfarlane, P. H.	Chisholm
Mach, Frank B.	Minneapolis
Macnie, J. S.	Minneapolis
MacRae, Gordon C.	Duluth
Madden, John F.	St. Paul
Maertz, W. F.	New Prague
Magath, T. B.	Rochester
Magee, Henry Ross	Rochester
Magie, W. H.	Duluth
Magiera, Estelle, A.	Minneapolis
Magney, F. H.	Duluth
Mahowald, A.	Albany
Major, S. G.	Rochester
Maland, C. O.	Minneapolis
Malmgren, George E.	Rochester
Manley, James R.	Duluth
Manley, L. V.	Albert Lea
Mann, A. T.	Minneapolis
Manson, F. M.	Worthington
Marcum, E. H.	Bemidji
Mariette, Ernest	Oak Terrace
Mark, D. B.	Minneapolis
Marsh, H. L.	Eveleth
Marshall, James M.	Rochester
Martin, Edw. T.	Duluth
Martin, Thomas Philip	Arlington
Martin, W. C.	Duluth
Martineau, J. L.	St. Paul
Martinson, C. J.	Wayzata
Mason, J. B.	Rochester
Masson, D. M.	Rochester
Masson, J. C.	Rochester
Matchan, Glen R.	Minneapolis
Matthews, Justus	Minneapoils
Mattill, P. M.	Oak Terrace
Mattison, P. A.	Winona
Maxeiner; Stanley R.	Minneapolis
May, W. H.	Minneapolis
Mayland, M. L.	Faribault
Mayne, Roy Malone	Duluth
Mayo, C. H.	Rochester
Mayo, Charles W.	Rochester
Mayo, Joseph Graham	Rochester
Mayo, W. J.	Rochester
Maytum, Charles K.	Rochester
Meierding, Wm. A.	New Ulm
Meighen, J. W.	Ulen
Meinert, A. E.	Winona
Meland, Ernest L.	Rochester
Melby, Benedik	Blooming Prairie
Melleby, O. F.	Thief River Falls
Melzer, G. R.	Lyle
Mercil, William F.	Crookston
Merkert, Charles E.	Minneapolis
Merkert, G. L.	Minneapolis
Merriman, L. L.	Duluth
Mesker, G. H.	Olivia
Messick, Joseph Marion	Rochester
Meyer, A. A.	Melrose
Meyer, P. F.	Faribault
Meyerding, E. A.	St. Paul
Meyerding, H. W.	Rochester
Michael, J. C.	Minneapolis
Michelson, H. E.	Minneapolis
Michie, Thomas Campbell	Rochester
Miller, H. A.	Fairmont
Miller, V. I.	Mankato
Miller, W. A.	New York Mills
Millet, Roscoe F.	Rochester
Mills, John L.	Winnebago
Milton, J. S.	Minneapolis
Mitchell, R. S.	Grand Meadow
Moe, Russel J.	Duluth
Moe, Thomas	Moose Lake
Moen, J. K., Jr.	Minneapolis
Moench, Mary	Rochester
Moersch, F. P.	Rochester
Moresch, H. J.	Rochester
Moga, John A.	St. Paul
Mogilner, S. N.	St. Paul
Mohardt, John Henry	Rochester
Moir, Wm. W.	Minneapolis
Molander, H. A.	St. Paul
Monroe, P. B.	Two Harbors
Montgomery, Hamilton	Rochester
Mooney, Leo P.	Marble
Moorhead, M. B.	Minneapolis
Moquin, Marie A.	St. Paul
More, C. W.	Eveleth
Morehead, D. E.	Rochester
Moren, Edwin	Minneapolis
Morey, John Barnhart	Rochester
Morgan, Sherburne F.	Rochester
Moriarty, Cecile R.	Minneapolis
Mork, B. O.	Worthington
Morley, G. A.	Crookston
Morrison, A. W.	Minneapolis
Morrissey, F. B.	St. Paul
Morrow, James J.	Austin
Morse, M. P.	LeRoy
Morsman, L. W.	Hibbing
Morss, C. R.	Zumbrota
Mortenson, N. G.	St. Paul
Morton, Herschel B.	Rochester
Morton, Silvanus Archibald	Rochester
Moses, Joseph, Jr.	Northfield
Moss, Myer N.	St. Paul
Moyer, Ralph E.	Bemidji
Moynihan, A. F.	Sauk Center
Moynihan, T. J.	St. Paul
Mroz, Rudolph John	Rochester
Mueller, S. C.	Rochester
Mulholland, Stanford W.	Rochester
Muller, R. Theo.	St. Paul
Murdoch, J. M.	Faribault
Murphy, George Thomas	Rochester
Murphy, Ignatius J.	Minneapolis
Murray, D. D.	Duluth
Mussey, R. D.	Rochester
Myers, Fred	Eveleth
Myers, J. A.	Minneapolis
Myers, Thos.	St. Paul
Myre, C. R.	Paynesville
Naegeli, A. E.	St. Paul
Naegeli, Frank	Fergus Falls
Nagel, H. D.	Waconia
Nass, H. A.	Mabel
Nathanson, M. H.	Minneapolis
Nauth, W. W.	Winona
Neher, F. H.	St. Paul
Nehring, Jesse Potter	Preston
Nelson, C. P.	Minneapolis
Nelson, E. H.	Chisholm
Nelson, Ernest J.	Owatonna
Nelson, Harvey	Minneapolis
Nelson, H. E.	Crookston
Nelson, H. S.	Minneapolis
Nelson, L. A.	St. Paul
Nelson, M. S.	Granite Falls
Nelson, Nesmith	Brainerd
Nelson, O. E.	Minneapolis
Nelson, O. N.	Battle Lake
Nelson, R. L.	Duluth
Nelson, Wallace LeRoy	Rochester
Nelson, Wallace I.	Underwood
Neseth, O. S.	Kenyon
Nethercott, E. G.	Pine City
Newmann, C. A.	Winona
New, G. B.	Rochester
Newhart, Horace	Minneapolis
Nicholson, M. A.	Duluth
Nickel, Allen A. C.	Rochester
Nickerson, W. S.	Faribault
Ninneman, Newton Noah	Silver Lake
Nippert, H. T.	St. Paul
Noble, John F.	St. Paul
Noran, A. N.	Minneapolis
Nordin, C. G.	St. Paul
Nordin, G. T.	Minneapolis
Nordland, Martin	Minneapolis
Norman, J. F.	Crookston
Norment, William B.	Rochester
Norrgard, H. T.	Milaca
Norris, Edgar, H.	St. Paul
Norris, G. H.	Annandale
Noth, H. W.	Minneapolis
Novak, E. E.	New Prague
Nusbaum, D. H.	Jackson
Nye, Katherine A.	St. Paul
Nye, Lillian L.	St. Paul
Nystrom, Ruth	Minneapolis

Oberg, C. M.	Minneapolis
O'Brien, H. J.	St. Paul
O'Brien, William A.	Minneapolis
O'Connor, D. C.	Eden Valley
O'Connor, J. P.*	St. Paul
O'Connor, L. J.	St. Paul
O'Donnell, D. M.	Ortonville
O'Donnell, J. E.	Minneapolis
Oerting, Harry	St. Paul
Offutt, Susan R.	Rochester
Ogden, Warner	St. Paul
Ohage, Justus	St. Paul
Ohage, Justus, Jr.	St. Paul
O'Hara, J. J.	Janesville
Ohlinger, L. B.	Chicago, Ill.
Ohnstad, J. L.	McIntosh
O'Leary, P. A.	Rochester
Oliver, C I.	Graceville
Oliver, I. L.	Graceville
Olson, Albert E.	Duluth
Olson, Archibald	Hendricks
Olson, Chas. A.	St. Paul
Olson, Chester J.	Belle Plaine
Olson, Ernest A.	Pine Island
Olson, F. A.	Minneapolis
Olson, Olaf A.	Minneapolis
Olson, R. G.	Minneapolis
Olson, W. P.	Gaylord
Onsgard, L. Kenneth	Houston
Onsgard, L. K.	Houston
Oppegaard, C. L.	Crookston
Oppegaard, M. O.	Crookston
Oredson, O. A.	Duluth
Ormond, Douglas	Waconia
Ortman, John Wessel	Pierz
Osborn, Lida	Mankato
Osborn, Burt F.	International Falls
Ostergren, E. W.	St. Paul
Otto, H. C.	Frazee
Overend, K. V.	Hallock
Overton, Lewis Marvi	Rochester
Owre, Oscar	Minneapolis

Page, C. V.	St. Paul
Page, R. L.	St. Charles
Palmer, C. F.	Albert Lea
Palmer, R. N.	Lanesboro
Palmer, W. L.	Albert Lea
Paradis, W. G.	Crookston
Parker, H. L.	Rochester
Parker, O. W.	Ely
Parks, A. H.	Minneapolis
Parson, L. R.	Elbow Lake
Parsons, J. G.	Crookston
Passer, A. A.	Olivia
Patmos, Martin	Rochester
Patterson, W. E.	Minneapolis
Patterson, W. E.	Westbrook
Patterson, W. L.	Fergus Falls
Paul, L. W.	Madison, Wis.
Paulsen, E. L.	Minneapolis
Paulson, T. S.	Fergus Falls
Pearce, Naboth Osborn	Minneapolis
Pearson, F. R.	St. Paul
Pearson, William T.	Finlayson
Pedersen, A. H.	St. Paul
Pederson, Harold	Minneapolis
Pederson, O. J.	Hanska
Pederson, R. M.	Minneapolis
Pemberton, J. deJ.	Rochester
Penhall, F. W.	Morton
Pennie, D. F.	Duluth
Peppard, T. A.	Minneapolis

---

*Deceased.

Perley, A. E.	Minneapolis
Perry, C. G.	St. Paul
Persons, C. E.	Marshall
Pertl, A. L.	Windom
Peters, R. M.	Minneapolis
Petersen, J. R.	Minneapolis
Petersen, Thorvald	Minneapolis
Peterson, A. A.	Mora
Peterson, Alfred	Dassel
Peterson, Herbert W.	Minneapolis
Peterson, Joel Asbury	Rochester
Peterson, Magnus Christian	St. Peter
Peterson, O. H.	Minneapolis
Peterson, O. L.	Cokato
Peterson, P. E.	Minneapolis
Peterson, R. A.	Vesta
Peterson, V. N.	St. Paul
Peterson, Willard C.	Minneapolis
Petit, L. J.	Minneapolis
Petraborg, Harvey Theodore	Stillwater
Pettit, C. W.	Minneapolis
Pfeffer, Theodore John	Rochester
Pfunder, M. C.	Minneapolis
Phelps, Kenneth A.	Minneapolis
Phillips, A. E.	Delano
Phillips, John Roberts	Rochester
Phillips, W. H.	Jordan
Pierson, Claude M.	Wheaton
Piper, M. C.	Rochester
Piper, Wm. A.	Mountain Lake
Platou, E. S.	Minneapolis
Platt, F. Bertram	Battle Lake
Plondke, F. J.	St. Paul
Plonske, C. J.	Faribault
Plummer, H. S.	Rochester
Plummer, W. A.	Rochester
Poirier, J. A.	Forest Lake
Pollard, D. W.	Minneapolis
Pollock, D. K.	Minneapolis
Pollock, L. W.	Rochester
Polzak, J. A.	Minneapolis
Pomeroy, Rex K.	Rochester
Poppe, Fred H.	Minneapolis
Porter, O. M.	Minneapolis
Portmann, W. C.	Jackson
Potter, Edith L.	Minneapolis
Power, J. E.	Duluth
Prangen, A. D.	Rochester
Pratt, Fred J.	Minneapolis
Pratt, J. A.	Minneapolis
Preine, I. A.	Minneapolis
Prendergast H. J.	St. Paul
Prescott, Manfred U.	Rochester
Prickman, Louis Elwood	Rochester
Priestley, Joseph Biddle	Rochester
Priestley, J. T.	Rochester
Prim, J. A.	Minneapolis
Pritchard, D. B.	Winona
Proshek, Charles E.	Minneapolis
Puestow, Charles Bernard	Rochester
Quinby, Thomas F.	Minneapolis
Quist, H. W.	Minneapolis
Raadquist, C. S.	Hibbing
Radabaugh, R. C.	Hastings
Rains, J. M.	Willmar
Raiter, Franklin, W. S.	Cloquet
Raiter, Roy F.	Cloquet
Ramsey, W. R.	St. Paul
Randall, Lawrence Merrill	Rochester
Rankin, F. W.	Rochester
Ransom, M. L.	Hancock
Rasmussen, C. C.	Fertile
Rathbun, A. M.	Rice
Rathbun, C. A.	St. Cloud
Reed, Chas. A.	Minneapolis
Rees, S. P.	Minneapolis
Regnier, E. A.	Minneapolis
Reineke, George F.	New Ulm
Reiter, H. W.	Shakopee
Rempel, Dietrich D.	Brownton
Rentschler, Edwin B.	Rochester
Replogle, W. H.	Wabasha
Reynolds, J. S.	Minneapolis
Rice, Carl O.	Rochester
Richards, E. T. F.	St. Paul
Richards, W. B.	St. Cloud
Richardson, Fred S.	Minneapolis
Richardson, Harold E.	St. Paul
Richardson, W. E.	Pipestone
Richardson, W. J.	Fairmont
Richdorf, L. F.	Minneapolis
Ridgway, A. M.	Annandale
Ridgway, Alexander	Belgrade
Ridgway, Florence	Minneapolis
Rieniets, John H.	Rochester
Rigler, Leo G.	Minneapolis
Ringle, Otto F.	Walker
Rishmiller, J. H.	Minneapolis
Risser, E. D.	Winona
Ritchie, H. P.	St. Paul
Rivers, A. B.	Rochester
Rizer, R. I.	Minneapolis
Rixford, Emmet L.	Rochester
Roadman, I. M.	Ponsford
Roan, Carl M.	Minneapolis
Robb, Edwin F.	Minneapolis
Robbins, C. P.	Winona
Roberts, L. M.	Little Falls
Roberts, Thos. S.	Minneapolis
Roberts, W. B.	Minneapolis
Robertson, A. W.	Litchfield
Robertson, H. E.	Rochester
Robertson, J. B.	Cottonwood
Robertson, P. A.	Austin
Robilliard, C. M.	Faribault
Robilliard, W. H.	Faribault
Robinson, J. M.	Duluth
Robitshek, E. C.	Minneapolis
Rochford, W. E.	Minneapolis
Rodda, F. C.	Minneapolis
Rodgers, C. L.	Minneapolis
Roehlke, A. B.	Elk River
Rogers, James Creighton T.	Rochester
Rogers, John T.	St. Paul
Roholt, C. L.	Waverly
Rollings, F. H.	St. Charles
Rood, D. C.	Duluth
Rose, J. T.	Lakefield
Rosen, S.	Minneapolis
Rosenberg, Maurice N.	Minneapolis
Rosenfield, A. B.	Pequot
Rosenow, E. C.	Rochester
Rosenthal, Robert	St. Paul
Rosenwald, R. M.	Minneapolis
Rothenburg, J. C.	Springfield
Rothrock, J. L.	St. Paul
Rothschild, H. J.	St. Paul
Rousseau, Victor	Maple Lake
Roust, H. A.	Montevideo
Rowe, O. W.	Duluth
Rowntree, L. G.	Rochester
Roy, J. A.	Red Lake Falls
Roy, Philemon	St. Paul
Ruby, Fred McK.	Union City, Ind.
Rucker, Charles Wilbur	Minneapolis
Rucker, William H.	Minneapolis
Rudell, Gustave	Minneapolis
Rudie, Clifford Norman	Mazeppa
Rudie, P. S.	Duluth
Ruedemann, Ehrkardt	Rochester
Ruffin, Willcox	Rochester
Ruhberg, George N.	St. Paul
Rumpf, C. W.	Faribault
Rumpf, William H., Jr.	St. Cloud
Rumpf, W. H.	Faribault
Rutherford, W. C.	St. Paul
Rutledge, L. H.	Detroit Lakes
Ryan, John J.	St. Paul
Ryan, Mark E.	St. Paul
Ryan, W. J.	Duluth
Rynearson, E. H.	Rochester
St. Clair G. G.	Duluth
Saarf, O. E.	Baudette
Sach-Rowitz, Alvin	McGregor
Sadler, William P.	Minneapolis
Saffert, Cornelius, A.	New Ulm
Sahr, W. G.	Hutchinson
Saliterman, B. I.	Janesville
Salt, C. G.	Minneapolis
Samson, E. R.	Chisholm
Sanderson, E. T.	Minneota
Satersmoen, Theo	Pelican Rapids
Sanford, A. H.	Rochester
Sather, Allen	Fosston
Satterlee, H. W.	Lewiston
Satterlund, Victor	St. Paul
Savage, F. J.	St. Paul
Sawatzky, Wm. A.	Minneapolis
Schaaf, F. H. K.	Minneapolis
Schaefer, Joseph F.	Rochester
Schaefer, S.	Winona
Schaefer, Wesley G.	Minneapolis
Schatz, F. J.	St. Cloud
Scheldrup, N. H.	Minneapolis
Scherer, C. A.	Duluth
Scherer, Leslie Raymond	Rochester
Scherer, Roland G.	Morgan
Schimelpfenig, Geo. T.	Chaska
Schlesselman, George	Anoka
Schlesselman, J. T.	Mankato
Schmidt, Geo. F.	Minneapolis
Schmidt, P. A.	Good Thunder
Schmitt, A. F.	Minneapolis
Schneider, H. A.	Jordan
Schoch, J. L.	New Ulm
Schoch, R. B.	St. Paul
Scholpp, O. W.	Hutchinson
Schons, E.	St. Paul
Schoofs, Gregor Elmer	North Branch
Schroder, C. H.	Duluth
Schuldt, F. C.	St. Paul
Schultz, J. A.	Albert Lea
Schulze, Albert G.	St. Paul
Schunk, Peter Monte	Rochester
Schutz, Elmer S.	Mountain Lake
Schwartz, Virgil J.	Minneapolis
Schwyzer, Arnold	St. Paul
Schwyzer, Gustav	Minneapolis
Schwyzer, R.	Minneapolis
Scofield, C. L.	Benson
Scott, D. E.	Rochester
Scott, F. H.	Minneapolis
Scott, R. A.	Detroit Lakes
Seaberg, J. A.	Minneapolis
Seashore, D. E.	Duluth
Seashore, Gilbert	Minneapolis
Seham, Max	Minneapolis
Seifert, Otto J.	New Ulm
Selleseth, Iver	Minneapolis
Senkler, G. E.	St. Paul
Senn, E. W.	Owatonna
Serkland, J. C.	Rothsay
Serrurier, Laurence Roland	Rochester
Sessions, John C.	Minneapolis
Setzer, H. J.	St. Paul
Shaleen, A. W.	Hallock
Shane, James Howard	Rochester
Shannon, S. S.	Crosby
Shannon, W. R.	St. Paul
Shapiro, E. Z.	Duluth
Sharp, Jay Emerson	Rochester
Shaw, A. W.	Buhl
Shedlov, A.	Fosston
Sheedy, Chester L.	Austin
Shelland, J. T.	Ada
Shellman, John L.	St. Paul
Sheldon, W. D.	Rochester
Shelver, H. J.	Ortonville
Sheppard, Fred	Hutchinson
Sheppard, P. E.	Hutchinson
Sherman, Carnot H.	Philadelphia, Pa.
Sherman, C. L.	Luverne
Sherwood, G. E.	Kimball
Shillington, M. A.	St. Paul
Shimonek, S. W.	Hibbing
Short, Jacob	St. Paul
Shrader, J. S.	Springfield
Simison, C. W.	Hawley
Simon, B. F.	St. Paul
Simons, Bernard H.	Chaska
Simons, Edwin J.	Swanville
Simons, Jalmar	Minneapolis
Simpson, E. D.	Minneapolis
Simpson, J. D.	Minneapolis
Sinamark, Andrew	Hibbing
Singer, Benj. J.	St. Paul
Siperstein, D. M.	Minneapolis
Sisler, C. E.	Grand Rapids
Sitar, Richard F.	Minneapolis
Sivertsen, Ivar	Minneapolis
Skinner, H. O.	St. Paul
Slater, S. A.	Worthington
Slocumb, J. A.	Plainview
Slocumb, Maude S.	Minneapolis
Slyfield, F. F.	Duluth
Smallwood, J. T.	Worthington
Smersh, J. F.	Owatonna
Smith, Archie M.	Thief River Falls
Smith, Arthur E.	Minneapolis
Smith, A. M.	Minneapolis
Smith, B. A.	Crosby
Smith, B. F.	Willmar
Smith, C. M.	Duluth
Smith, E. H.	Bemidji
Smith, E. K.	Duluth
Smith, F. D.	Kasson
Smith, F. L.	Rochester
Smith, Harry L.	Rochester
Smith, Homer R.	Minneapolis
Smith, L. G.	Montevideo
Smith, M. W.	Red Wing
Smith, Newton D.	Rochester
Smith, Norman M.	Minneapolis
Smith, P. A.	Faribault
Snell, Albert M.	Rochester
Snyder, G. W.	St. Paul
Soderlind, A.*	Minneapolis
Soderlind, Ragnar T.	Minneapolis
Sogge, L.	Windom
Sohlberg, Olaf	St. Paul
Sohmer, A. E.	Mankato
Soine, Tyler Sylvester	Barnesville
Solhaug, S. B.	Minneapolis
Sommer, A. W.	Elmore
Souster, B. B.	St. Paul
Spicer, F. W.	Duluth
Spooner, Alexander Dwight	Rochester
Sprafka, J. M.	St. Paul
Spratt, C. N.	Minneapolis
Stacy, L. J.	Rochester
Stangl, Fred	St. Cloud
Stangl, Philip E.	St. Cloud
Stanley, C. R.	Worthington

---

*Deceased.

Stark, W. B.	Rochester
Steffens, L. A.	Red Wing
Steiner, I. W.	Winona
Stelter, Lloyd A.	Minneapolis
Stemsrud, A. A.	Dawson
Stenstrom, Annette Treble	Minneapolis
Stephan, E. L.	Hinckley
Stephenson, George W.	Rochester
Sterner, E. G.	St. Paul
Sterner, O. W.	St. Paul
Steven, Geo	Byron
Stevens, F. A.	Lake Elmo
Stevens, R. B.	Rochester
Stevenson, B. M.	Fulda
Steward, John Alexander	Rochester
Stewart, Alexander	St. Paul
Stewart, A. B.	Owatonna
Stewart, C. A.	Minneapolis
Stewart, C. C., Jr.	Rochester
Stewart, Gwendolyn	Faribault
Stewart, Nelson W.	Lead, S. D.
Stewart, R. I.	Minneapolis
Stierle, Adolph, Jr.	St. Paul
Stillwell, W. C.	Mankato
Stinnette, S. E.	St. Paul
Stolpestad, H. L.	St. Paul
Strachauer, Arthur C.	Minneapolis
Strader, E. L.	Deerwood
Strand, E. V.	Bayport
Strathern, F. P.	St. Peter
Strathern, M. L.	Gilbert
Stratte, A. K.	Pine City
Stratte, Harold C.	Windom
Strobel, W. G.	Duluth
Strout, E. S.	Minneapolis
Strout, G. Elmer	Minneapolis
Sturre, J. R.	Minneapolis
Stryker, W. B.	Plainview
Stuart, A. B.	Cloquet
Stuck, Walter Goodloe	Rochester
Stuhler, Louis G.	Rochester
Stuhr, J. W.	Stillwater
Stuurmanns, S. H.	Erskine
Sukeforth, L. A.	Duluth
Sullivan, Raymond	Minneapolis
Sundt, M.	Minneapolis
Sutherland, C. G.	Rochester
Sutherland, H. N.	Ely
Sutton, Chas. S.	St. Cloud
Sutton, L. F.	Mazeppa
Swanson, Cephas	Minneapolis
Swanson, Edwin O.	St. Paul
Swanson, John A.	St. Paul
Swanson, Roy E.	Minneapolis
Swart, H. A.	Rochester
Swedenburg, A. W.	Thief River Falls
Sweetser, H. B., Jr.	Minneapolis
Sweetser, H. B.	Minneapolis
Sweetser, Theodore	Minneapolis
Sweitzer, S. E.	Minneapolis
Swendseen, Carl G.	Minneapolis
Swendson, J. J.	St. Paul
Swennes, O. S.	Wahkon
Swenson, A. O.	Duluth
Swenson, Charles	Braham
Swenson, O. J.	Waseca
Swezey, B. F.	Buffalo
Sybilrud, H. W.	Bricelyn

Taft, John O.	Minneapolis
Tangen, Geo. M.	Canby
Tanquist, E. J.	Alexandria
Tavenner, Lyle John	Waseca
Taylor, C. W.	Duluth
Taylor, H. L.	St. Paul
Taylor, James Edwin	Rochester
Taylor, Rood	Minneapolis
Taylor, Wm. J.	Pipestone
Teisberg, C. B.	St. Paul
Telford, V. J.	Edgerton
Ternstrom, O. H.	Minneapolis
Thabes, John Alois, Jr.	Brainerd
Thabes, John Alois, Sr.	Brainerd
Thabes, J. A.	Brainerd
Thomas, Geo. E.	Minneapolis
Thomas, Geo. H.	Minneapolis
Thomas, Gilbert J.	Minneapolis
Thompson, Albert	St. James
Thompson, Arthur	Raymond
Thompson, H. H.	Minneapolis
Thompson, V. C.	Marine-on-St. Croix
Thordarson, Theo	Minneota
Thornby, H. J.	Moorhead
Thornton, Harold Clive	Rochester
Thorson, E. O.	Luverne
Thorson, Orin P.	Northfield
Theysell, F. A.	Moorhead
Tibbetts, M. H.	Duluth
Tiedemann, Elmer John	Adrian
Tierney, C. M.	Harmony
Tilderquist, D. L.	Duluth
Tingdale, A. C.	Minneapolis
Tofte, Josephine	Dawson
Tovell, Ralph Moore	Rochester
Traeger, C. A.	Faribault
Traxler, Felix John	Henderson
Tregilgas, H. R.	South St. Paul
Trueman, Harold S.	Minneapolis
Truog, Clarence P.	Lindstrom
Trutna, Thos. J.	Silver Lake
Tunstead, Hugh	Minneapolis
Tuohy, E. L.	Duluth
Turnacliff, D. D.	Minneapolis
Turnbull, Robert	Fosston
Tweedy, G. J.	Winona
Tyrrell, C. C.	Minneapolis
Tyvand, Raymond E.	Rochester

Ude, Walter H.	Minneapolis
Ulrich, Henry L.	Minneapolis
Undine, Clyde A.	Minneapolis
Urberg, S. E.	Duluth
Urner, John A.	Minneapolis

Vaaler, T.	Cannon Falls
Vadheim, Alfred L.	Tyler
Vail, James B.	Henning
Valentine, W. H.	Tracy
Van Slyke, Chas. A.	St. Paul
Van Valkenburg, B. F.	Long Prairie
Van Valkenburg, F. W.	Long Prairie
Vanzant, Frances Ralston	Rochester
Vaughan, Victor M.	Truman
Veirs, Dean	St. Paul
Veirs, Ruby Smith	St. Paul
Verbrugghen, A. H. P. E.	Rochester
Vercellini, C. E.	Duluth
Vik, A. Elliott	Minneapolis
Vik, Melvin	Onamia
Vinson, P. P.	Rochester
Vogel, Joseph H.	New Ulm
Vogtel, Melvin A.	Minneapolis
Von der Weyer, Wm.	St. Paul
Voyer, Emile O.	Minneapolis
Vrooman, F. E.	St. Francis

Waas, Charles William	St. Paul
Wagener, H. P.	Rochester
Wahlquist, Harold F.	Minneapolis
Wakefield, Elmer Glenn	Rochester
Waldron, Carl W.	Minneapolis
Waldron, G. W.	Rochester
Walker, A. E.	Duluth
Walker, G. H.	Winona
Walker, Maurice Andrew	Rochester
Wall, C. R.	Minneapolis
Waller, Joseph D.	Wilmont
Walters, Waltman	Rochester
Wangensteen, Owen H.	Minneapolis
Wanous, E. Z.	Minneapolis
Ward, A. W.	Minneapolis
Ward, Percy A.	Minneapolis
Warham, T. T.	Minneapolis
Warnock, R. W.	St. Paul
Warren, E. L.	St. Paul
Warren, F. S.	Faribault
Watkins, C. H.	Rochester
Watson, A. M.	Royalton
Watson, F. G.	Worthington
Watson, James R.	Rochester
Watson, J. A.	Minneapolis
Watson, John D.	Holdingford
Watson, N. M.	Red Lake Falls
Watson, Sydney	Worthington
Wattam, G. S.	Warren
Webb, R. C.	Minneapolis
Webber, Edward E.	Duluth
Webber, Fred L.	St. Paul
Weber, H. M.	Rochester
Webster, William W.	Rochester
Weir, J. D.	Browns Valley
Weir, J. F.	Rochester
Weirick, Howard R.	Hibbing
Weiser, Geo. B.	New Ulm
Weisman, S. A.	Minneapolis
Welch, M. C.	St. Paul
Wellbrock, William L. A.	Rochester
Wellcome, J. W. B.	Sleepy Eye
Welles, H. J.	Minneapolis
Wenner, W. T.	St. Cloud
Wentworth, A. J.	Mankato
Werner, O. S.	Cambridge
West, Elmer Johnson	Duluth
Westby, Magnus	Madison
Westby, Nels	Madison
Westerman, A. E.	Montgomery
Westerman, F. C.	Montgomery
Wethal, A. G.	Minneapolis
Wetherby, Macnider	Minneapolis
Weum, T. Wm.	Minneapolis
Whalen, M. L.	Duluth
Wharton, George K.	Rochester
Wheeler, D. W.	Duluth
Wheeler, M. W.	St. Paul
Whitacre, J. C.	St. Paul
Whitcomb, Ed. H.	St. Paul
White, S. Marx	Minneapolis
White, J. S.	St. Paul
White, Willard D.	Minneapolis
Whitmore, Frank	St. Paul
Whitson, S. A.	Alden
Widen, W. F.	Minneapolis
Wieckman, F. H.	Sleepy Eye
Wiese, H. F. B.	Minneapolis
Wilbur, D. L.	Rochester
Wilcox, Archa E.	Minneapolis
Wilder, Robert L.	Minneapolis
Wilken, Paul A.	Minneapolis
Wilkinson, Stella	Duluth
Will, W. W.	Bertha
Willcutt, Clarence	Minneapolis
Williams, H. L.	Minneapolis
Williams, Hugh O.	Lake Crystal
Williams, M. R.	Cannon Falls
Williams, Robert	Minneapolis
Williams, R. J.	Pine River
Williams, R. V.	Rushford
Williams, A. B.	St. Paul
Williams, Clayton	St. Paul
Williams, Henry Lane, Jr.	Rochester
Williams, Leon A.	Slayton
Williamson, George A.	St. Paul
Willius, F. A.	Rochester
Wilmot, H. E.	Litchfield
Wilson, L. B.	Rochester
Wilson, Warren	Northfield
Wilson, R. H.	Winona
Wilson, W. E.	Northfield
Wilson, W. F.	Lake City
Wiltrout, I. Geo.	Oslo
Winnick, J. B.	St. Paul
Winter, J. A.	Duluth
Winther, Nora M. C.	Minneapolis
Wittick, F. W.	Minneapolis
Wohlrabe, A. A.	Minneapolis
Wohlrabe, Clarence	Springfield
Wohlrabe, E. J.	Springfield
Wold, K. C.	St. Paul
Wolff, Herman J.	Rochester
Wolner, Oscar H.	St. Peter
Woltman, H. W.	Rochester
Wood, Douglas F.	Minneapolis
Wood, H. G.	Rochester
Woodruff, C. W.	Chatfield
Woodworth, Elizabeth	Minneapolis
Workman, H. M.	Tracy
Workman, W. G.	Tracy
Wray, W. E.	Campbell
Wright, C. B.	Minneapolis
Wright, Charles D'Arcy	Minneapolis
Wright, C. O.	Luverne
Wright, Franklin R.	Minneapolis
Wunder, Henry E.	Shakopee
Wyatt, O. S.	Minneapolis
Wynne, H. M. N.	Minneapolis

Yaeger, W. W.	Ivanhoe
Ylvisaker, R. S.	Fergus Falls
Yoerg, O. W.	Minneapolis
Young, T. O.	Duluth
Young, V. A.	Duluth

Zachman, A. H.	Melrose
Zanger, Isabelle M.	Minneapolis
Zaworski, E. A.	Minneapolis
Zeien, Thos.	North Branch
Zemke, Erhart Edmund	Fairmont
Zierold, A. A.	Minneapolis
Zimmerman, H. B.	St. Paul
Zinn, Charles J.	Rochester
Ziskin, Thomas	Minneapolis
Zlatovski, Michael	Duluth

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

Vol. XIV JUNE, 1931 No. 6

A CONSIDERATION OF SECONDARY ANEMIA*

W. H. Long, M.D.
Dakota Clinic
Fargo, North Dakota

THE frequency with which we encounter patients with secondary anemia justifies a review of the subject. Their successful management depends upon the ferreting-out of the primary cause of the condition and remedying that condition. We must carry out active measures directed to the restoration of the blood to normal. A prescription for Blaud's mass and the advice, "Eat plenty of liver," will not suffice.

The term secondary anemia includes two groups: the anemias which can be attributed to a primary cause, and the group of cases which present similar characteristics but which must be classed idiopathic secondary anemia because we are unable to ascertain the primary cause. The primary cause may be increased blood loss from hemorrhage, either acute or chronic, or deficient blood formation from depression of the marrow by the presence of toxins of various origin.

The blood findings characteristic of secondary anemias are definite. The hemoglobin reduction is prominent, and the red count less strikingly reduced. This gives us constantly a color index of less than one. The leukocytes are normal in number except in long-standing cases where the bone marrow has become exhausted. The stained smears show achromia or faint staining and a tendency of cells to be smaller than normal with varying degrees of deformity. With an active marrow there is a considerable polychromatophilia, while in long-standing cases, with a depressed marrow, very little is to be found. Reticulated cells are found in about the normal percentage.

The classification of secondary anemias, according to the grouping suggested by Watkins, is interesting and will prove helpful in further study of these cases. We have followed the shift in the leukocyte counts in these cases under treatment and, in prognosis, the careful study of the leukocytes is helpful. The cases with pronounced shift to the right are certainly more resistant to treatment.

Certain cases are encountered with a color index near one and perhaps with an associated achylia which are difficult to distinguish from primary pernicious anemia. The determination of the volume index, which is a measurement of average red cell volume, is helpful. The demonstration of increased bilirubin by the Vandenberg reaction or the icterus index test, which indicate increased blood destruction, may decide the proper classification. We have used the therapeutic test of feeding ordinary liver extract and following the reticulated cell count in two border-line cases, the absence of reticulate response being against the primary pernicious type.

The cases most easily recognized are those due to acute hemorrhage. The history usually is significant. Certain fundamentals are, at times, forgotten in managing such cases, and these may cause serious error. For instance, the hemoglobin and red blood count are not likely to be altered until six to twelve hours after the acute hemorrhage. The leukocyte rise is prompt and may reach 15,000 to 18,000. The predominant leukocyte is the polymorphonuclear. These points should be remembered in deciding between the possibility of intestinal tract hemorrhage and infection and in appraising the severity of hemorrhage. Following the leukocyte and platelet counts in intra-abdominal hemorrhage can be very helpful in the management of such cases. In all cases of acute hemorrhage, the determination of the presence of a blood dyscrasia, as the primary or as a complicating factor, is important. In purpura, the leukocyte count is likely to be lower and the platelet count is constantly low, the bleeding time increased and the clot does not retract normally.

---

*Read at the meeting of the Northern Minnesota Medical Association, Moorhead, Minnesota, September 20, 1930.

The two following cases are typical examples of those due to blood loss and are cited to illustrate how little the patients were impressed by that blood loss and how closely they must be questioned to bring it out.

Miss D. P., aged 16, was referred as a case of chlorosis. The week before she had felt light-headed, dizzy and had had some headache. She became very tired, short of breath on climbing stairs, and three days before she had fainted. On direct questioning, after some hesitation, she remembered that the stools had been dark the past three days and that, for the past month, she had had an uncomfortable hungry sensation in the epigastrium in the mid-morning and mid-afternoon. The hemoglobin was 24 per cent, red blood count 1,220,000, white blood count 6,500, platelets 176,000, bleeding time 3 minutes, coagulation time 4 minutes, and the stool contained blood (Grade IV) and the X-ray revealed a duodenal ulcer.

R. B. P., aged 17, presented almost an identical history, attributing all his symptoms to the extreme heat of the summer and having overlooked entirely his black stools and having thought nothing of his hunger pains, both symptoms having been elicited only by the closest questioning.

Chronic blood loss is a much more frequent cause of secondary anemia. Here there are a long list of conditions which must always be considered: peptic ulcer, hemorrhoids, diverticulitis, intestinal polyposis, cirrhosis, menorrhagia—and it is surprising how frequently the patient has not been at all concerned by considerable amounts of continued blood loss. Here, again, it is essential to exclude possible complicating chronic purpura and, also, to determine the activity of the marrow by study of the presence of nucleated cells, polychromatophilia and the leukocytic type.

The two following patients presented themselves for the treatment of their anemia.

Mrs. G. L., aged 32, the mother of two children, gave a history of irregular menstruation lasting seven to fourteen days and requiring nine to ten pads daily. She had noticed that she bruised easily. Her father was subject to severe nose bleeds. Her mother bled excessively and a sister bleeds easily and excessively. The laboratory reported: Hemoglobin 25 per cent, red blood count 2,670,000, white blood count 8,850 (p. m. n. 75.5 per cent, lymph. 21, mononuclear 2, transitional 4.5), anisocytosis II, poikilocytosis II, achromia II, bleeding time 3 minutes 35 seconds, coagulation time 8 minutes 30 seconds, platelets 84,000, normal retraction of clot.

The uterus was found to be slightly enlarged and of the hard fibrous type and a small mass was present in the right adnexa.

Dietary treatment with iron, arsenic and calcium was instituted.

One month later the hemoglobin was 39 per cent, red blood count 3,780,000, white blood count 6,500, platelets 112,000.

Following three transfusions the hemoglobin was 50 per cent, red blood count 4,730,000, white blood count 7,900, platelets 264,000.

On August 6, 1930, a fibroid uterus and cystic right ovary were removed. The spleen was examined and found not enlarged.

The transfusions brought about marked general improvement but the blood count did not improve satisfactorily. But for the right pelvic mass, radium or X-ray might have been used to induce temporary cessation of the menses until the blood had been restored to normal. The question of the presence of a chronic, hemorrhagic purpura was difficult to settle with the low platelet counts, but I think this diagnosis was not justified because of a normal bleeding time and a normal retraction of the clot.

Another such case was that of Mrs. P. E., aged 20, who had suffered from menorrhagia two years before but not since her marriage at the age of nineteen.

Her hemoglobin was 55 per cent; r. b. c. 4,900,000; w. b. c. 5,400. A mass was found in the right adnexa which proved at operation to be a cyst of the ovary. This and a small cyst on the left tube were removed.

In 1926 the patient was seen again. At this time, the blood showed a hemoglobin of 35 per cent; r. b. c. 4,170,000, index .4 plus; w. b. c. 7,150. The menstrual flow had been excessive and irregular, and a mass was present in the right adnexa.

At operation August 9, 1926 a double salpingectomy was performed for bilateral salpingitis and a right tubo-ovarian abscess was removed. Two transfusions were given. The hemoglobin rose to 42 per cent.

In spite of operation, the excessive flow continued and, on March 1, 1927, radium was given to produce complete cessation. General improvement was prompt and has continued well since. Hemoglobin has continued rather low, never exceeding 50 per cent until the past year. The blood picture now shows a hemoglobin of 76 per cent and r. b. c. 4,800,000. There were never any manifestations of purpura.

Certainly these cases are trying and it seems as though certain individuals are endowed with a poor hemopoietic system. They show poor response to stimulating measures and are very susceptible to any chronic loss of blood.

The third and very common type of secondary anemia is that associated with chronic toxemias and infections. Common causes are tuberculosis, syphilis, chronic focal infections, malignancies, nephritis, and pregnancy. Faulty diet, poor hygiene and actual dietary deficiencies often play a large part in these. There is defective blood formation and likely some measure of increased blood destruction.

The blood picture in such cases is not characteristic. If long continued, the state of semi-aplasia may become established. The smears should be studied for evidence of exhaustion of the marrow.

Of special importance are the anemias of pregnancy. We have encountered an unusually large number of patients with rather high degrees of anemia in the last trimester of pregnancy. In some of these, recovery has been very slow and, even after delivery, they have remained under par for long periods. It is important to ascertain its presence early, as the earlier treatment is carried out the better the result. Recently there have been numerous reports in the literature on the anemias of pregnancy and I think the condition is best summarized by Pepper as follows:

1. A mild anemia occurs physiologically in pregnancy.
2. The physiologic anemia may become severe in individuals previously anemic, also as a result of hemorrhage or of complicating infections, of which syphilis is apparently the most important.
3. Severe so-called pernicious anemia of pregnancy is not identical with Addisonian anemia (primary pernicious anemia). The grade of anemia may be as marked and certain features of the blood picture suggestive, but other essential criteria are lacking.
4. Sepsis may be the cause of such an anemia and the lack of leukocytosis does not exclude this possibility.
5. Early recognition of anemia beyond the "physiologic" grade, and prompt treatment will, in the majority of instances, avoid the development of the more severe grades of anemia, which, in the past, have been termed "the pernicious anemias of pregnancy."

The anemias associated with nephritis have likewise been the subject of many reports recently. The condition is so constant and the degree of anemia so parallels the severity of renal damage that it can be used as a reliable prognostic guide. The most complete report is that of Ashe, who studied 300 cases and concluded that the degree of anemia could be very helpful in deciding the degree of renal damage in cardiovascular-renal disease.

The anemias of syphilis, of chronic infections, arthritis, and of chronic ulcerative colitis are likely to be severe and are peculiarly likely to have an associated splenomegaly.

Possibly splenic anemia should not be mentioned, but, inasmuch as the anemia is of a distinctly secondary type, it is included. The essential features in such cases are the marked leukopenia and the associated hepatic cirrhosis.

One patient observed presented herself in October, 1926, because "she was run down." Her hemoglobin was 45 per cent, r. b. c. 3,240,000, index .7, w. b. c. 5,700. Examination was negative except for a severe sinus infection. The sinuses were operated upon and she was placed upon a suitable diet, iron and arsenic. Two months later, the hemoglobin was 60 per cent, r. b. c. 4,120,000, and the general condition much improved. At that time, there was a question as to whether or not the spleen could be felt. She returned in October, 1928, stating she had been well for one year after the last visit, when she began to have epigastric distress of an indefinite type and became weak and run down again. The blood picture was: Hemoglobin 35 per cent, r. b. c. 3,030,000, index .5; w. b. c. 1,750, platelets 162,000, p. m. n. 5, lymph. 78, trans. 10, mono. 5, anisocytosis II, poikilocytosis II, polychromatophilia slight. The spleen was markedly enlarged and hard. Splenectomy was performed November 24, 1928. Recovery was prompt, the blood picture improved rapidly, and one month later the hemoglobin was 64 per cent, r. b. c. 3,950,000, w. b. c. 5,200 on leaving hospital. She was heard from during the past summer and has remained in good health.

Why some individuals develop these rather severe degrees of anemia with these infectious processes and others do not is an interesting speculation. That they have a definitely vulnerable hemopoietc system is suggested by the occasional definite familial involvement. The following two families are mentioned because of the several members observed:

Mrs. C. W. C. was found upon examination to be suffering from amebiasis and a pelvic tumor, the nature of which was not determined. She had not suffered from menorrhagia. There was no free hydrochloric acid in the stomach contents. Her blood picture showed a hemoglobin of 35 per cent; r. b. c. 4,030,000; w. b. c. 6,900. She had been treated for anemia for the past four months.

Mrs. R. S., a sister, was found to have dental sepsis.

An endocervicitis and a blood picture showed the hemoglobin 55 per cent; r. b. c. 3,760,000; w. b. c. 5,950. She also had no free hydrochloric acid in the stomach.

Mrs. C. W. C., another sister, was found to be suffering from chronic constipation, chronic sinusitis, and had a hemoglobin of 40 per cent; r. b. c. 3,600,000; w. b. c. 6,250. She too had no free acid in the stomach contents.

These patients have all been restored to health, the first by eradicating the amebic infection and two transfusions. The other two did not require transfusions. A fourth sister was seen with a gastric cancer.

In the other family, Mr. E. G. presented a typical picture of primary pernicious anemia (hemoglobin 52 per cent, r. b. c. 1,880,000, index 1.4, w. b. c. 4,950). There was no free hydrochoric acid in the stomach contents and there was a history of glossitis. Stool examination showed many *Balantidium coli* present. It is interesting to note that the parasite was promptly eradicated by a series of neoarsphenamin treatments but the course of the disease not affected. He was seen first in 1927, is still under observation and promptly relapses if he neglects taking liver extract.

A sister, Mrs. A. F. N., aged 29, was found to be suffering from a sinusitis and dental sepsis. Her hemoglobin was 30 per cent, r. b. c. 3,490,000, index .4, w. b. c. 5,800. There was no free hydrochloric acid in the stomach contents. Neurological findings were normal.

Another sister, Mrs. C. S. G., aged 32, suffered from menorrhagia caused by a fibroid uterus. Her hemoglobin was 48 per cent, r. b. c. 3,760,000, index .6 per cent.

The treatment of secondary anemias consists in:

1. The care of the primary cause when it can be found.
2. Supplying adequate iron.
3. Stimulation of the hematopoietic organs.

Chronic blood loss from menorrhagia is certainly one of the most frequent causes encountered. In young women and girls, striking reduction in flow has frequently been obtained by one or two stimulating doses of X-ray to the ovaries. In more severe cases, we have induced temporary cessation by heavier doses of X-ray or by radium. In patients approaching the menopause, we give sufficient radiation to obtain complete cessation.

A supply of adequate iron is insured by feeding foods high in iron content and the administration of ferrous carbonate or of reduced iron. Whipple found certain fruits (apricots, prunes, and raisins) had a decidedly better effect than vegetables in restoring the blood after repeated blood losses. Of vegetables, spinach was the only one that was of special benefit. Our practice is to give a well-balanced diet, high in vitamins, with plenty of red meats, green vegetables, whole wheat bread, fruits and a daily portion of liver or kidney.

The use of liver in secondary anemia has been reviewed innumerable times in the literature since its use has become fixed in the primary anemias. Strikingly convincing are the reports of Whipple and of Keefer and Yang. Whipple found that dogs, rendered anemic by blood loss, regenerated their blood much more rapidly when fed on diets rich in liver and kidney rather than when fed muscle meat. Keefer and Yang followed the daily fluctuation in hemoglobin, red counts and the reticulated cell response in thirty-seven cases of secondary anemia and concluded that liver and iron, given in combination, were more effective than either given alone. In a more recent communication, Whipple reports the isolation of a palatable liver fraction potent in anemia due to hemorrhage. Such an active extract for use in secondary anemia will be a distinct addition to our present methods. Giffin has recently reported on the use of fetal liver, but that is very hard to obtain and is not likely to become readily available.

One method of stimulation of blood formation which is too often neglected and which practically never fails us is the use of transfusions. Two or three transfusions will restore these people more rapidly than any other means. The citrate method is entirely satisfactory, the reactions are but few and seldom severe. In any patient who is at all slow to respond and especially if there are any signs of semi-aplasia (that is, low white blood count, low polymorphonuclear count, low platelet count and absence of polychromatoplasia), we transfuse at once.

Arsenic is very valuable as an adjunct. Many times where ferrous carbonate alone has failed, addition of arsenic has brought about prompt improvement. We have used bone marrow extract in the form of hemogennin without especially significant results. Ultra-violet radiation, natural or artificial, is an important aid. The use of copper with iron has given us some strikingly good results.

SUMMARY

1. Secondary anemia must be treated first by removal of the primary cause.
2. Care must be taken to exclude chronic pur-

pura in all cases of acute or chronic blood loss.

3. Closest consideration of the history is required in determining blood loss as the patient is often not sufficiently impressed.

4. Adequate dietary management to include abundance of vitamins, iron-containing food and the long-continued use of liver and kidney, as well as muscle meats, is important.

5. Drugs in the form of iron and arsenic have not been supplanted by newer means.

6. Transfusions are practically never-failing and are too often omitted in the management of secondary anemia.

BIBLIOGRAPHY

1. Giffin, H. Z., and Watkins, C. H.: Secondary anemia. Jour. Am. Med. Assn., 95:587 (Aug. 23), 1930.
2. Keefer, C. S., and Yang, C. S.: The value of liver and iron in the treatment of secondary anemia. Jour. Am. Med. Assn., 93:575 (Aug. 24), 1929.
3. Oslie, Benj.: The hemoglobin percentage and red blood cell count in Bright's disease, myocardial insufficiency and hypertension. Arch. Int. Med., 44: 506 (October), 1929.
4. Pepper, O. H. P.: A review of our knowledge of the anemias of pregnancy. Med. Clin. No. Am., 12: 925 (January), 1929.
5. Watkins, C. H.: A classification of chronic idiopathic secondary anemia, with special reference to the morphology of the blood. Jour Am. Med. Assn., 23:1365 (Nov. 2), 1929.
6. Whipple, G. H.: Hemoglobin constituents within the body as influenced by diet factors. Am. Jour. Med. Sc., 175:721 (June), 1928.
7. Whipple, G. H., Robscheit-Robbins, S. F.: Blood regeneration in severe anemia. XXI. A liver fraction potent in anemia due to hemorrhage. Am. Jour. Med. Sc., 179:628 (May), 1920.

AVERTIN

The Council on Pharmacy and Chemistry reports that Avertin was submitted for consideration in February of this year; that it recognizes the fact that the product presents certain desirable properties but that definite action concerning its recognition is postponed pending investigation of certain of its side actions now being conducted. For the information of the medical profession the Council submits a report concerning the present status of the drug. Avertin is tribrom-ethanol. It was introduced in Germany in 1926, to be used alone for rectal anesthesia, or to be supplemented by other narcotics, including morphine and ether. Later Avertin was offered in a solution, 1 c.c. of which contains 1 Gm. of Avertin dissolved in amylene hydrate (tertiary amyl alcohol). This solution has been the subject of several hundred reports. After reviewing the reported advantages and disadvantages the Council concludes: though the present evidence indicates that Avertin may prove valuable as a means of initiating narcosis but not for complete narcosis, the Council decided not to admit the drug to New and Non-official Remedies. (Jour. A. M. A., November 8, 1930, p. 1427.)

DISINFECTANTS

In combating contagion, modern sanitary practices have eliminated disinfectants for spraying walls, ceilings and floors of school rooms. The source of infection is the individual; so long as the infected individual is present in the room, any disinfectant that might be used on the walls or the floor would be of little if any value in preventing infection. Removal of the infected individual usually suffices to end the danger of spreading the infection. Soap and water is the best agent for cleaning floors, together with plenty of fresh air and sunshine. Terminal disinfection, such as fumigation with formaldehyde, has been generally discarded as valueless. In the case of lavatories, urinals and toilet bowls, so-called germicides in reality accomplish nothing except covering up the primary odor by the stronger odor of the chemical used. "Disinfection of hands" may be obtained by a thorough scrubbing with soap and water. In laboratories in which pathologic material is being handled, a solution of mercuric chloride or a solution containing "compound solution of cresol" may be employed. (Jour. A. M. A., March 28, 1931, p. 1098.)

ENDOMETRIOSIS*

FRANK E. KLIMAN, PH.C., B.A., M.D.
Duluth, Minnesota

MANY theories have been advanced to account for the presence of endometrium-like tissue in such places as the ovary, recto-vaginal septum, uterus, and in extragenital locations. No one theory, however, has been adequate to explain the origin of all these heterotopic growths.

The existence of endometriomata was known as early as 1899, when Russel reported the first case of endometriosis of the ovary. Due to the fact that cells of the germinal layer dip into the ovarian stroma and are cut off from the parent structure, they cannot be distinguished from endometrial glands. Because of his knowledge of this phenomenon, Russel claimed that endometriomata originated from the germinal epithelium.

Cullen holds that endometrial growths arise from aberrant Müllerian rests. Sampson, on the other hand, supports the view that endometrial cysts are the result of implantation and development of uterine epithelium which has escaped, with menstrual blood, through the Fallopian tubes. Other authorities disagree with Sampson, claiming that if his view were correct we should expect to find more cases of endometriosis following such uterine manipulations as curettage, transuterine insufflation, lipiodol injections, etc. Halbane believes that endometriosis spreads along the lymphatic channels, whereas Lockyer has brought out the serosal theory.

The serosal theory is based on investigation which shows that all genital epithelia are derived from the urogenital fold. From this fold are developed the lining of the Müllerian ducts, the germinal epithelium of the ovary and the pelvic peritoneum. Hence, the endometrium and lining of the tubes are considered as modifications of the pelvic peritoneum. Lockyer accordingly believes that, since the pelvic peritoneum and germinal epithelium originate from the same layer, any abnormal hormonal stimulation may initiate a regional differentiation into endometrium. In reviewing the theories that have been advanced, the "serosal theory" comes closest to being correct. It seems to account for all forms of endometriosis, whether in the ovary, pelvic peritoneum, inguinal canal or recto-vaginal septum.

Endometrial growths are governed by the ovaries just as is the normal endometrium. This view is strengthened when we note their histological structure, reaction during pregnancy, and the characteristic cyclic changes occurring in them during menstruation. That there is a continued activity in ectopic endometrium in the presence of functioning ovaries, is a well known fact. It is also known that misplaced endometrial tissues cease to function when ovarian hormonal activity is removed by ablation of the ovaries surgically or otherwise.

It is not my purpose in this short paper to cover the whole field of endometriosis, but to confine myself to endometrioma of the recto-vaginal septum, report a case, and sketch the treatment used in this condition.

From the standpoint of treatment, endometriomata or adenomyomata of the recto-vaginal septum are divided into four main groups.

Isolated, discrete nodules in and freely movable with the vaginal wall are placed in Group I. This type is quite rare.

Group II includes those small tumors in the upper part of the vaginal wall, as a rule posterior to the cervix and occasionally attached to it, but not involving the rectum. In this same group are those tumors found posterolateral to the cervix, extending into the uterosacral or into the base of the broad ligament. Those tumors when about 1 cm. in diameter are usually smooth and globular. When they grow larger they become irregular, due to the formation of new nodules.

Group III takes in those tumors involving the supra-vaginal portion of the cervix, upper portion of the vaginal wall and anterior rectal wall, but which are still confined to the pouch of Douglas. The ureters, lateral walls of the rectum, and uterine adnexæ are not involved. A puckered vaginal or rectal wall, bluish or slate colored, marks the site overlying the tumor nodules. The puckering is due to attachment of the vaginal or rectal walls to the nodule. The picture is that of a blue dome cyst in the breast.

Group IV.—To this group belong those tumors originating in the recto-vaginal septum, but which spread so as to involve cervix, vagina, rectum, broad ligaments, and may surround and constrict the ureters and mat the pelvic structures into an almost homogeneous mass.

---

*Presented before the St. Louis County Medical Society, Duluth, Minn., November 13, 1930.

The symptoms and signs vary according to the size of the growths and the viscera involved. Groups I and II rarely produce symptoms and are discovered on routine examination. Tumors in Group III, on the other hand, produce lower abdominal pain, dull or grinding in character, tenesmus, pressure and fullness in the rectum, aggravated by defecation and during the premenstrual period. Occasionally there is bleeding from the rectum, which leads to a diagnosis of hemorrhoids. In the intermenstrual period, since the tumor does not swell, the above symptoms are diminished or absent. Menorrhagia or a prolonged duration of the period is usually present.

In group IV, in addition to the above mentioned symptoms, there is pain and tenderness of the tubes and ovaries. Further, we find the symptoms of hydro-ureter, unilateral or bilateral, as well as pyelitis, where secondary infection has occurred as a result of stasis caused by the constricting growth. These symptoms, as mentioned before, are increased just before and during menstruation, as a result of the ovarian activity on the endometrial tissue.

Treatment is dependent upon the size and location of the tumors as well as the structure involved. Tumors in Group I and those in Group II which are attached to the cervix but do not involve the uterine ligaments are treated by surgical removal through a vaginal incision. Where the dissection is difficult it is better to use radium in order to avoid the formation of a recto-vaginal fistula. For tumors in Group II, involving the uterine ligaments, Cullen advocated extensive dissection. He reported cases in Group III as well, where he resorted to surgery, occasionally resecting rectum, sigmoid and bladder. In a later series of cases Cullen observed a decrease in the size of the tumors involving rectum and bladder where no resection, but only ablation of the ovaries was the treatment. This evidence indicated that absence of the ovarian hormonal activity caused the same atrophic changes in the tumors as it did in normal endometrium.

It is now advised by many authorities that tumors of all groups are best treated by means of radium, X-ray, or a combination of both.

The following case is reported in which radium and X-ray were used successfully:

Mrs. E. W., aged 31, married, consulted me on March 1, 1930, for a shooting pain in her right side present for a week. There was no nausea or vomiting but the patient suspected a return of a pylorospasm (for which she had been treated eight years previous) or an attack of appendicitis.

On questioning, the following history was elicited. The menses started at thirteen, occurred regularly at twenty-eight day intervals but since her marriage were seven days in duration. As long as she could remember she had had pain in her rectum three to four days before each menses. This pain was worse when she was nervous. She was examined on several occasions and advised that she had hemorrhoids. There was no loss of weight, but the patient fatigued easily. While she was not nervous, she was more irritable than usual. The cardiovascular and pulmonary history was negative. She also had had several examinations to determine the cause of her sterility. These examinations were quite complete except that she had not had a Rubin test (likely examined before the test was used).

Past illnesses.—The patient had had a curettage and rectal dilatation and had been treated for albumin and casts in the urine, for low blood pressure, and for a pylorospasm.

Family history.—Aside from the fact that her mother has Bright's disease, the family history was negative.

Physical examination.—The patient was of slight build but well nourished. The head and neck were normal except for slight thyroid enlargement. Heart and lungs were normal. The pulse was 84, temperature 98.2, blood pressure 110/70. There was slight tenderness over McBurney's point but none in the epigastrium. A slight tremor was present in the fingers.

Pelvic examination.—The vulva was normal. The introitus admitted two fingers. There was no vaginal discharge, erosion of the cervix, nor laceration present. The uterus was small and freely movable, normal in size, position and shape. The left ovary and adnexa were normal. The right ovary was prolapsed and tender. Just posterior to the cervix a hard, non-sensitive nodular mass the size of a marble was felt in the midline. The mass was bluish in color and appeared to be in the recto-vaginal septum.

Laboratory examination.—Urine normal. White blood count 8,700. Red blood count 4,440,000. Hemoglobin 85 per cent. Basal metabolism rate plus 5. A diagnosis of endometrioma of the recto-vaginal septum, prolapsed ovary, and chronic appendicitis was made. The patient was advised to return for observation and a Rubin test.

On April 8, 1930, the patient returned still complaining of pain in the rectum, but now located more in the region of the anus. There were only occasional twinges of pain on the right side. Examination at this time revealed a tumor definitely palpable in the recto-vaginal septum the size of a walnut. There was a small blood cyst on the posterior lip of the cervix. The right ovary was the size of an egg, but not tender.

The right broad ligament was infiltrated and the mobility of the uterus was somewhat limited. Proctoscopic examination revealed a slate colored nodule the size of a hazel nut in the rectum, two inches from the anus, which bled easily when touched with a probe.

The patient was given 826 mgm.-hours of radium in two treatments at an interval of twenty-four hours. The radium was placed in the vagina against the growth and held in place with gauze. Filtration consisted of 2 mm. lead; 1 mm. brass; .5 mm. silver. In addition she received X-ray treatments over the abdomen and lower back.

Following radiation the patient suffered little ill effects save a diarrhea which lasted four days and a drawing sensation in the right inguinal region. Since radiation the patient menstruated twice. Proctoscopic examination revealed no further bleeding or ulceration and the growth had entirely disappeared, leaving only a depression at the original site. On vaginal examination the cervix was clean, there was no discharge or blood cyst present, the uterus was freely movable, normal in size, position and shape. The adnexæ were negative, although both ovaries were prolapsed and small. The growth behind the cervix was white in color and only the size of a pea. Abdominal tenderness was absent and the patient had had no more pains.

Because of several points of similarity to my case I present herewith the salient features of two cases reported by Heineberg.

Case 1.—A female, aged 27, had had regular and painless menses since their onset at the age of thirteen. She had had a curettage for uterine discharge. Later she developed pain in the hypogastrium radiating to the iliac region. There was distinct tenderness over McBurney's point. Both ovaries were tender and prolapsed and at operation were found bound down in the pouch of Douglas. The appendix was adherent to the right ovary and was removed. The patient was not relieved of her pain but in addition to the iliac pain suffered a sensation of fullness and pain in the rectum, especially before menstruation. Later examination revealed increase in the size of the left ovary, with thickning of the left utero-sacral ligament. At the second operation both ovaries were again adherent to the pouch of Douglas. The left ovary was the site of multiple cysts and three times the normal size. This was removed. Following operation the patient still had her pain in the rectum. The mass in the utero-sacral ligament became nodular. A diagnosis of adenomyoma was now made and the patient was treated with radium and had no further rectal pain.

Case 2.—The main symptoms in this case were pain in the rectum, accentuated before menstruation. Here, too, the appendix was removed because of iliac pain. Physical examination revealed a flattened nodular mass adherent to the posterior vaginal wall, cervix and rectum. The patient had the right tube and ovary removed without relief of her pain. Now, examination showed the tumor to be twice the size. The patient was treated by inserting four needles 12.5 mg. radium in the tumor for twenty-four hours. While she continued to menstruate the growth had decreased in size and her rectal pain disappeared.

SUMMARY AND CONCLUSIONS

1. The cases presented had many symptoms in common.
2. Rectal pain increased just before menstruation should lead the examiner to suspect endometrioma of the recto-vaginal septum.
3. Radium and X-ray, or a combination of both, is the treatment of choice because of less chance of formation of a recto-vaginal fistula, and the advantage of more complete ablation of ovarian activity.

BIBLIOGRAPHY

1. Cullen, T. S.: Adenomyoma of the Uterus. Philadelphia: W. B. Saunders Co., 1908.
2. Graves, W. P.: Am. Jour. Obst. and Gynec., 10:665 (Nov.), 1925.
3. Heineberg, Alfred: Am. Jour. Obst. and Gynec., 14:235 (Aug.), 1927.
4. Keene, Floyd: Am. Jour. Obst. and Gynec., 10:617 (Nov.), 1925.
5. Personal communication, Mayo Clinic.
6. Sampson, J. A.: Am. Jour. Obst. and Gynec., 10:649 (Nov.), 1925.
7. Sampson, J. A.: Arch. Surg., 3:245 (Sept.), 1921.

OFFICE TREATMENT OF CHRONIC CERVICITIS*

SUSAN R. OFFUTT, M.D.
Rochester, Minnesota

THE chief objectives of treatment of chronic cervicitis are: (1) relief of annoying leukorrhea, (2) removal of a chronic inflammatory lesion which may be precancerous, and (3) elimination of a possible focus of infection.

In treating leukorrhea the etiology must be established. Gonoccocal infection of Skene's and Bartholin's glands may be the source of the discharge, and treatment should be directed against a specific type of infection. The discharge may be due entirely to vaginitis resulting from change in the chemical reaction of the secretion from the cervical glands that secrete mucus, or to the presence of the *Trichomonas vaginalis.* The most common cause of discharge is, of course, cervicitis, which may be primary, or associated with other inflammation.

Chronic cervicitis frequently is characterized by chronic erosion, and this may become later the site of epithelioma. Early carcinoma may be easily mistaken for simple erosion if the eroded area bleeds from contact with a swab on examination or if the velvety character of the surface is lost. Unless biopsy is obtained the diagnosis is not made until considerable valuable time has been lost to the patient.

The cervix must be considered as a possible focus of infection when all foci are being eliminated in the treatment of episcleritis, iritis and arthritis. Also, an infected cervix may be the source of pelvic cellulitis, of low grade, by extension of the infection from the cervix into the lymphatic structures, especially if there is extensive laceration of the cervix.

If the cervix of those women who have borne children is treated in the postpartum period, the entire problem of treatment of chronic cervicitis will be simplified. Whether immediate or later repair is made depends on circumstances. Neglect of postpartum cervicitis may mean later involvement of the upper pelvic structures, which may require major operation. However, most cases seen in the office are not in patients who are in the postpartum period but are of longer standing, due to previous trauma or infection.

Topical applications, such as mercurochrome, iodine, silver nitrate, and phenol, give temporary relief in many cases, but the deeper glands remain infected and the symptoms recur. Diathermy, injection of alcohol and medical ionization also clear up the disease superficially. All these methods give variable results from the patient's as well as from the physician's viewpoint. The infected cervical glands must be destroyed to get the best results, and this may be accomplished by cauterization of the cervix in the office or elsewhere by surgical treatment of the cervix.

If the lacerations are of marked degree, and if the cervix is edematous and angry-looking, it is well to put the patient to bed and to administer hot douches slowly; this results in shrinking of the cervix and may modify the extent of the operation necessary. If operation must be done, it is limited to simple trachelorrhaphy if possible; in more marked cases, a Schroeder or Sturmdorf operation is performed, and in the extreme cases amputation either by the knife or cautery is necessary. However, in the majority of cases the disease is milder, and can be treated in the office by the cautery, with or without anesthesia, depending on the extent of the lacerations and the infection present.

The technic of office cauterization is well established. Except for personal preferences concerning the type of cautery tip, the type of transformer, and the after-care of the patient, the technic is about uniform, and is well described and illustrated by Dickinson. The nasal cautery tip is placed against the area to be treated and the current is turned on. The diseased tissue is covered then by a number of incisions, depending on the depth into the tissue as well as the extent up the canal toward the internal os to which the process has penetrated. The important thing is completely to destroy the infected glands. Few patients complain of pain, and when they do complain of it it is not an unbearable pain; it is not pain in the cervix, but a dull aching across the lower part of the abdomen, similar to a menstrual cramp. This sometimes can be lessened by reducing the current. In most cases the necessary cauterization can be done at one sitting. If the patient is unusually nervous and complains of too much pain, or if the cervix can be only poorly exposed, anesthesia is then given. After cauterization the patient is advised to wear a pad and report every other day. I prefer not to use local applications to the cervix or to have the patient use douches, but to allow the sloughing to proceed without interference. The patient is examined every three or four days. The discharge, which at first is increased, usually stops in ten to fourteen days, but complete healing does not occur for about two months, depending on how deeply or extensively the cervix has been cauterized. After the sloughing is over, douches are used, and the cervix may be treated locally twice a week with mercurochrome, until healing is completed.

---

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the joint meeting of Chicago Medical Society and the Chicago Council of Medical Women, Chicago, Illinois, October 29, 1930.

There are three possible complications in cauterization of the cervix: (1) hemorrhage, (2) stenosis, and (3) pelvic infection. The bleeding seen after cauterization done in the office usually is slight and is due to oozing of the sloughing surface. Moderate bleeding at a given point can be stopped by lightly touching the bleeding point again with the cautery.

I have not seen any alarming hemorrhages from the cervix due to sloughing after cauterization done in the office, but I have seen profuse menstrual bleeding following the procedure when it was done near a menstrual period and precipitated menstruation. When this occurs, the patient is put to bed and is given ergot.

Stenosis rarely occurs after cauterization done in the office. Before the patient is dismissed from observation, the cervical canal is examined with a cotton applicator, and any filmy adhesions that may have formed are broken. Unless the cauterization has been too extensive and has included the internal os, complete stenosis will not occur. In case of stenosis, dilatation of the canal under anesthesia has to be done.

After cauterization of the cervix I have not seen any cases of pelvic infection nor any cases in which latent pelvic infection has been stimulated. Precautions are taken not to cauterize a cervix which is the seat of an acute infection, particularly one due to gonococci, with or without salpingitis. Cauterization is done midway between times of menstrual flow. Occasionally, it is necessary to cauterize the cervix a second time either because all the infected portions were not destroyed at the first cauterization or because reinfection has taken place.

SUMMARY

In treating leukorrhea, the etiology must be established. If it is due to chronic cervicitis, with or without erosion, superficial treatment will produce only temporary healing in many cases. The best results will be obtained by cauterization of the cervix in mild and moderately severe cases, or by operation in the extensive cases.

THE NEUROLOGICAL ASPECT OF HEAD INJURIES*

William H. Hengstler, M.D.
Saint Paul

THE subject of head injuries is one of vital importance today to every practicing physician and surgeon. With the vastly increasing accident rate, due to present day motor vehicle traffic, it behooves every medical man to be alert and well-informed in this particular field. Head injuries, in general, have always heretofore been considered as belonging to the realm of general surgery. Actually, however, a comparatively small percentage of them require any real surgical attention. Bruised and lacerated scalps, simple skull fractures without displacement of fragments, basal skull fractures and the like are, of course, fundamentally surgical, but these require so little actual treatment that they may be dismissed, as it were, with a wave of the hand, and no time need be given here to a consideration of them. Compound skull fractures, serious hemorrhage, either intra- or extra-cranial, and fractures with depression of fragments are, of course, real surgical problems and often require operative intervention. In head injuries as a class, however, we are not concerned so much with what happens outside the skull or to the skull itself as we are with what actually happens to the brain and its coverings. For this reason, we herewith adopt as a premise the fact that all head injuries have a neurological aspect and that the greater percentage of them belong primarily in the neurological field of medicine.

In our consideration of what actually happens to the intracranial contents in a head injury, we must remember two vitally important facts:

1. A very bad brain injury may occur without a fracture of the skull.
2. Extensive skull fractures may take place without any actual injury to the brain or its coverings.

The occurrence of either of these two does not necessarily signify the existence of the other.

Let us then try to visualize what may occur, intracranially, in a head injury. Protected as it is, within the skull, by its membranous coverings and the cerebrospinal fluid, the brain is able to withstand, to a remarkable degree, trauma applied to the skull. The effect on the brain must necessarily depend upon the degree of trauma, the method and point of its application and the particular circumstances during and after the accident. The first notable thing that happens is what we term concussion. Various definitions of concussion have been devised such as "molecular disturbance of brain cells resulting in loss of consciousness," etc. Symonds, of London, in the British Medical Journal of November 10, 1928, defines concussion as "a condition of sub-total cessation of cerebral function following immediately upon the injury and lasting only a few moments, with subsequent complete recovery within twenty-four hours." He assumes that unconsciousness or a clouding of consciousness which persists for more than this length of time is not concussion, but is evidence of structural brain injury. We subscribe to the belief that concussion itself may last longer than twenty-four hours, and we designate, arbitrarily, various degrees of concussion, as follows:

1. Slight concussion, in which unconsciousness or clouding of consciousness lasts from a moment up to one hour.
2. Moderate concussion, in which normal consciousness remains absent for a period up to twenty-four hours.
3. Severe concussion, in which consciousness is absent or clouded for a period greater than twenty-four hours.

In any event, we believe that concussion itself does not necessarily imply structural brain or intracranial injury, and likewise that the absence of a true concussion does not eliminate structural injury to the cranial contents. Hemorrhage into the brain itself and into the subarachnoid space, with bruising or contusion and actual laceration of the brain itself, are far more frequent in head injuries than is commonly believed. The delicate structure of the brain, the highly specialized and organized system of blood vessels serving it, and its relationship to the membranes which cover it and to the bony structure which houses it, make it very vulnerable as far as minor injuries to it are concerned.

---

*Thesis presented before the Minnesota Academy of Medicine, November 12, 1930.

If we accept Trotter's explanation of concussion, we may assume that with sudden severe trauma the skull acts as a semi-elastic body and is momentarily compressed, so that its contents are squeezed dry. Unconsciousness and a flaccid paralysis of the body follow, as a result of the sudden cerebral anemia. Recovery of consciousness takes place through a gradual return of physiologic function from the medullary centers progressively upward, so that the whole clinical picture is one of temporary vascular embarrassment. In addition to the above, if the trauma is severe enough or is applied at the proper point, we have a shaking up of the brain and its coverings, with bruising or contusion or lacerations and with hemorrhage of greater or lesser magnitude, with petechial bleeding in the substance of the brain itself, intraventricular hemorrhages or subarachnoid bleeding due to rupture of meningeal vessels. Any such clinical picture as the above results in immediate edema of the brain with increase in intracranial pressure due to fluid increase. Such a condition may result in a markedly prolonged period of lost or clouded consciousness, due solely to increased intracranial pressure instead of true concussion or structural brain injury.

Illustrative of this is the case of B. E., a little girl eight years old, who was seen in consultation with Dr. Albert Ahrens of St. Paul, about two years ago. This child had been knocked down by an automobile and when first seen had been totally unconscious for three or four days and remained very clouded for ten or twelve days more. At the time we first saw her, she lay in a semi-stupor; was unable to swallow, her sensorium was completely obliterated, and although her eyes were open there was absolutely no true consciousness present. She had been fed with a tube all of the time since her injury. A spinal puncture showed a clear fluid under greatly increased pressure. The first drainage resulted in immediate cerebral improvement, and several subsequent spinal drainages cleared her completely in a few days, improvement being noted after each one was done.

A second illustration may be given in the case of a man referred to us from Menomonie, Wisconsin, four or five years ago, who had sustained a severe concussion by being thrown from a railroad train, his head striking the base of a telegraph pole. Although he sustained a concussion, he cleared very shortly and was referred to us some ten or twelve days after the accident, because of headache, vertigo, sluggish mental reflexes and personality changes. Examination showed no focal signs of brain injury, and neurologically there was no evidence of any structural injury to the brain. His eyegrounds, however, showed marked evidence of increased intracranial pressure. Assuming that this man had a wet brain following the accident, he was sent to the hospital and daily spinal drainage was performed for some five or six days, the fluid being clear but under marked increase in pressure. Following each drainage, there was relief, both subjectively and objectively, and at the end of ten days or two weeks he had completely regained his normal personality; his mental reflexes had become normally active, his vertigo and headache had disappeared and his eyegrounds had returned to a normal condition.

In addition to the injuries already enumerated, we often have the exhibition of cranial nerve lesions following head trauma. These may be due to nuclear injury, such as hemorrhage or contusion, or they may be due to injury to the nerves themselves after they leave the base of the brain on their way to the exit from the skull. The latter occur notably in basal skull fractures and in severe subarachnoid hemorrhage, particularly at the base. These cranial nerve lesions are valuable from the standpoint of diagnosis and localization, and are temporary or permanent, according to the location and degree of the injury. It must be remembered that hemorrhage by "countre coup" is a frequent and often undiagnosed factor in head injuries. In attempting localization, this possbiility should ever be borne in mind.

Passing on, we will undertake to consider, from the angle of the neurologist, the immediate treatment of the head injury, assuming that no operative condition exists, and confining our observations to the intracranial condition. If concussion exists, with a rapid return of normal consciousness, and no signs of focal injury or intracranial hemorrhage, no particular treatment is indicated other than absolute rest for a day or two, with relief of subjective symptoms as they may arise. If unconsciousness or a clouding of consciousness persists, a careful and complete neurological examination is indicated, with very close observation of the patient's condition from one hour to another. The examination is directed toward localization of any intracranial injury and toward the condition of intracranial pressure. To these ends particular attention is paid to cranial nerves and to reflexes in the extremities, to the eyegrounds, the pulse, the temperature, the respiration and the blood-pressure. Careful note is also made of the condition of the individual's sensorium. We believe spinal puncture to be valuable from the standpoint of diagnosis as well as treatment, and we use it unhesitatingly and have never seen it do any harm. The occurrence of bloody spinal fluid proves conclusively subarachnoid or intraventricular hemorrhage, assuming, of course, that the fluid is uniformly bloody and not merely blood-tinged in the first few drops where the needle strikes a vessel in the operation of puncture. Likewise, subsequent punctures reveal the condition of the hemorrhage—a gradual daily fading in the coloring of the fluid showing that the hemorrhage has ceased.

From a therapeutic point of view, drainage of the canal reduces the fluid intracranial content and relieves increased intracranial pressure and frequently promotes rapid clearing of consciousness. It has been our observation that this is particularly true in those cases as cited above, where consciousness has partly returned but is cloudy and in which there is no paralysis or other evidence of focal brain injury. We have several times seen a marked benefit rendered to paralyzed cranial nerves by repeated spinal drainages. Repetition of the drainage is made in direct accord with the degree of increased pressure of the fluid which is observed. It is frequently repeated every twelve hours; in other instances every twenty-four to forty-eight hours, as the individual case seems to warrant. There is no definite rule as to frequency of drainage or amount of fluid withdrawn. Each case determines its own status in these respects. We believe in spinal drainage in proper cases; we advocate it and we prefer it to the use of saline or magnesium sulphate.

Miss M. R., a patient seen with Dr. Carles N. Hensel, of St. Paul, in the winter of 1928-1929, is an example of the large number of cases in which spinal drainage has shown itself to be definitely valuable. Knocked down by an automobile and sustaining an apparent slight concussion, with laceration of her scalp, she was taken home, walked into her house and up two flights of stairs to her bedroom, and a short time later collapsed again unconscious. We saw her about two and one-half hours after the injury was sustained. Her consciousness was very clouded. She had a marked sensory aphasia and was in very poor condition generally. Diagnostic spinal puncture showed bloody spinal fluid, under markedly increased pressure. A full drainage was done and repeated at twelve hour intervals several times, with marked improvement after each drainage. This patient subsequently recovered, uneventfully, except that she has permanent loss of sense of taste and sense of smell. The aphasia did not persist. In this particular case, the bloody spinal fluid did not clear at once, several successive punctures indicating the presence of fresh blood. This fact, together with the marked increase in pressure shown at each puncture, is, to our mind, evidence that the constant intracranial bleeding would probably have killed this patient had not the pressure been relieved at intervals by spinal drainage. It has been our observation that there is a better prognosis in severe head injuries which present a bloody spinal fluid under greatly increased pressure than in those where the fluid is clear and under normal or reduced pressure.

Careful observation during the first thirty-six or forty-eight hours after injury often permits the early diagnosis of concealed or delayed intracranial hemorrhage, with focal symptoms such as paralysis of one kind or another or a second gradual loss of consciousness. It is in this class of cases where operative intervention is often most valuable.

A patient seen with Dr. L. E. Daugherty, in St. Paul, in the winter of 1929, had been injured by a collision between his car and a railway train. He was taken unconscious to a hospital, regained consciousness shortly, and seemed to be all right in every way. Within a few hours, however, he began to notice motor disturbance in one of his lower limbs, which gradually progressed to a complete paralysis, with reflex changes of the upper motor neuron type, and with a clouding of the sensorium which finally reached total unconsciousness. Operative intervention was advised following localization of the hemorrhage and a decompression, performed by Dr. Harry P. Ritchie, disclosed a subdural clot of considerable size, which was removed, and the patient recovered fully.

Most important and often most difficult is the task of determining permanency in head injuries and of deciding which of the existing sequelæ will never be relieved. No hard and fast rule can be applied in making such tests. Each case must be studied as an individual problem and classified accordingly. There are, however, certain definite after-effects which are commonly found in head injuries and which can be looked for quite uniformly in all cases. The remote effects of these injuries are most important from the industrial and medico-legal angle, and it is well to give them a prominent place in this discussion. To begin with, we must classify these symptoms very positively into subjective and objective. Among those predominating in the subjective group are the following:

1. Headache
2. Vertigo
3. Nausea
4. Inability to concentrate normally
5. Failure of memory
6. Emotional disorders, such as depression, fear and anxiety
7. Premature fatigability.

Among those prominent in the objective group are:

1. Paralyses of various kinds
2. Vomiting
3. Reflex changes
4. Inability to sleep
5. Marked loss in weight
6. Crying spells
7. Spells of intense emotional disorder
8. Aphasia or amnesia.

Without attempting to treat each of these singly, but grouping them for consideration, it can be stated first that the average case of head injury presents far more subjective than objective symptoms from the standpoint of sequelæ. One naturally expects, after a head injury of sufficient magnitude to produce concussion, that there will be for a time an exhibition of many or all of these after-effects. As to just how long they will last, however, is a matter of opinion, based largely on experience and circumstances surrounding the individual case.

Of the subjective sequelæ enumerated above, the most persistent are headache, inability to concentrate normally, and premature fatigability. Under ordinary conditions, it will be conceded that six months is sufficient time to heal a simple skull fracture without depression of fragments, no matter where this is situated. The various subjective symptoms usually disappear, in irregular fashion, in from three months to one year after the injury, depending upon their severity. The resistance of the individual and the speed with which litigation and questions of compensation and damages are settled are very important factors in determining the length of time required for such symptoms to disappear. The last is of paramount importance. Regardless of how the settlement is made or of how favorable or unfavorable to the injured person it may be, the fact that the case is settled and out of the way is always beneficial and expedites recovery. The facing of a law-suit, with the inevitable anxiety attendant to it, and the necessity of keeping all facts in mind to recite to the jury, is a great obstacle to recovery.

As to the objective symptoms, it may be stated briefly that those symptoms which persist for more than one year will probably be permanent. It is surprising how many abnormal reflexes will adjust themselves to normal in the course of twelve months after an injury and how many objective signs and symptoms will disappear during that length of time. Here again, of course, the individual case must be taken into consideration, but, in general, permanency is reached after a year has elapsed, and those sequelæ persisting that length of time may be considered as permanent. Again, in the consideration of sequelæ, particularly those in the subjective group, the age of the individual is most important as far as prognosis is concerned. We have had under our observation, at intervals, a detective who was slugged in a jewel robbery a few years ago, having been knocked out by a black-jack in the hands of the highwayman, and sustaining thereby a stellate fracture of the outer table of the skull, in the parietal region. He was unconscious only a few moments and there were no focal signs and no intracranial complications. Neurological examinations have been repeatedly negative, and nothing objective has ever been found, yet he has never been able to work a day at his regular profession with the Pinkerton Agency since he was hurt. Sixty-two years old when injured, he has never been able to regain his normal power of concentration at his work, cannot follow instructions accurately and cannot make out ordinary reports. In addition, he is depressed and somewhat upset emotionally. Were he twenty or thirty years younger, he probably would have recovered long ago. As it is, he will doubtless never work again at his regular employment.

Conversely, a young man of twenty-seven, recently seen, who sustained a very severe head injury in the crash of the Northwest Airways plane last year, receiving a severe concussion with multiple skull fractures, and an evidently profound cerebral disturbance, will probably recover his normal efficiency and be able to go on with his regular work. He presents the same clinical picture, subjectively, as the first mentioned case, but has the advantage of being young and in the constructive period of life. Thus it is seen that a multiplicity of factors must govern the permanency of after-effects in head injuries, but in a general way it may be reiterated that the majority of those who recover fully do so in one year's time.

Statistically, it is difficult to state positively what percentage of head injuries becomes permanently disabled or recover fully. An analysis of seventy-one cases, by Symonds, in which he had secured accurate data at periods remote from the accident, shows 10 per cent totally disabled, 43.5 per cent able to return to light work, and 46.5 per cent able to return to full work. These seventy-one patients were individuals who had sustained definite cerebral disturbance following head injury.

One cannot leave this subject without a word in comment upon mental deterioration and epilepsy, as sequelæ of head injuries. As far as the former is concerned, we believe that genuine mental impairment following head injury is comparatively infrequent. So-called mental deterioration or feeble-mindedness in children, which for purposes of litigation is frequently attributed to some head injury sustained early in life, usually turns out to be ordinary congenital mental deficiency. Permanent mental impairment or deterioration to the extent of requiring institutional care is certainly rare.

Epilepsy as a sequel of head injury is often a matter of dispute in the court room and a matter of difference in opinion among medical men. Briefly, it may be said that the only kind of epilepsy which follows head injuries is the Jacksonian type. This is always due to focal brain injury or irritation. Epileptic spells may occur in the early stages of a head injury and are probably due to hemorrhage into the subarachnoid space, and do not always mean a permanent likelihood of attacks. Jacksonian epilepsies, developing after a period of many months or years after the injury, are much more serious. Essential epilepsy, in any form, is never caused by head injury, and as a rule if the Jacksonian type of spells are going to occur, they usually make their appearance within a reasonable period of time after the injury, probably within six months. If they appear at an interval more remote than that, they are usually due to cyst formation, abscess or some degenerative lesion, which takes time to develop.

The subject of head and brain injuries is one of profound interest and importance. As stated in our opening paragraph, we believe it to be largely neurological. Certainly, it is deserving of the consideration of every member of the medical profession.

1068 Lowry Medical Arts Building.

TREATMENT OF SECONDARY DEFORMITY IN CASES OF HARELIP*

GORDON B. NEW, M.D., AND FREDERICK A. FIGI, M.D.
Rochester, Minnesota

AT THE present time, the results from operations on harelips by those experienced in this type of work are excellent in a large percentage of cases. There are, however, a certain number of cases in which operations have been performed by inexperienced surgeons, and secondary deformities have resulted which require correction (Fig. 1*a* and *b*). Such deformities may not be the result of the operation but may be due to the fact that the child was in poor physical condition at the time of the operation or that the wound became infected. In these cases a careful general examination should be made, and, if necessary, the patients should be observed carefully until their condition is such that operation is advisable. As a rule, the results from operation for harelip are much better during the spring, summer and autumn than during the winter, on account of the tendency to upper respiratory infections with running of the nose. We operate in winter only on children who cannot be brought to us at any other time. The use of silkworm-tension sutures to hold the ala in position and of a Logan clamp to relieve the tension on the suture line are both invaluable aids in preventing secondary deformity, regardless of the method employed.

The deformity may be of a minor nature, such as slight flaring of the nostril, or notching or irregularity of the vermillion margin, but such deformities detract from an otherwise good result and are noticeable. At times one sees such deformity as slight flattening of the upper lip due to approximation of the alveolar process by wires, or the more marked deformity due to the loss of the greater portion of the upper jaw from a disastrous attempt forcibly to approximate the jaw. The marked flattening of the upper lip resulting from the removal of the premaxilla is a common deformity. Secondary deformity presents greater problems in correction than the original condition on account of the loss of tissue and the scarring (Fig. 2*a* and *b*).

The aim of the surgeon when he accepts for operation a patient with a single harelip should be to make the nose and lip so shaped that the average person would not know that a deformity had existed. To accomplish this ideal means that many secondary operations must be performed, some of which, however, may be of a minor nature.

A common postoperative deformity in cases of single harelip is the displacement of the median line of the nose to one side with rotation of the tip of the nose and flaring of the nostril. There is also frequently notching or irregularity of the vermillion margin. In such cases the long axis of the oval-shaped vestibule of the nose on the harelip side is usually directed laterally instead of anteroposteriorly. This deformity is usually the result of incomplete freeing of both cheeks and nose at the time of the operation, and not rotating the tissue below the ala of the nose into the nostril to form the floor, as Blair has shown. It is well to make a nostril a little smaller and the outer extremity of the ala a little higher than the opposite side at the time of the operation, as there is always a tendency for the spring of the cartilage to cause the ala to displace outward and downward (Fig. 3*a* and *b*).

The correction of this deformity usually requires thorough freeing of the lips, cheeks and cartilage of the nose, and possibly refracturing of the nasal bones to bring the nose to the median line and fix it in this position with sutures or splints. To change the oval-shaped opening of the vestibule of the nose so that the long axis is anteroposteriorly instead of laterally a triangular wedge of cartilage is excised from the anterior part of the columella below the tip of the nose, and, by rotating the cartilage forward and inward, correcting this deformity. Fixing the cartilage and ala in its new position by means of silk sutures and silkworm-tension sutures is essential. The ends of the silkworm sutures are fixed by lead buttons and shot. In order to allow the flared ala to be brought into its correct position without folding, it is sometimes necessary to free the skin and mucous membrane from the cartilage so that the cartilage will slide between the skin and the mucous membrane, or to crosshatch the cartilage at certain points to eliminate the curve. In this type of deformity it may be necessary to remove a piece of the cartilage from the margin of the ala and the tip of the nose, as this is usually lower than the remainder of the nose, due to its rotation (Fig. 4*a* and *b*).

---

*From the Section on Laryngology, Oral and Plastic Surgery, The Mayo Clinic, Rochester, Minnesota. Submitted for publication January 7, 1931.

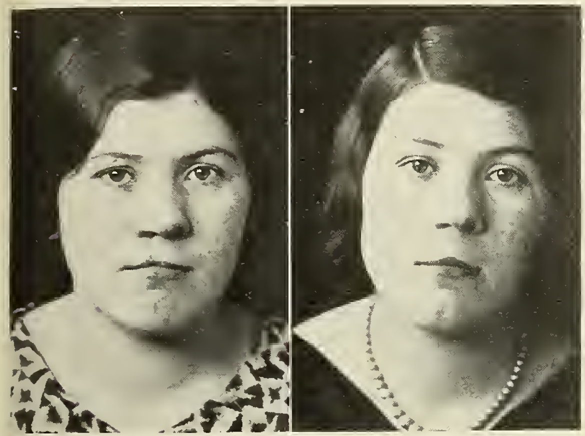


Fig. 1. *a,* Flared nostril with notching and irregularity of the vermillion margin; *b,* deformity corrected by rotating inward the ala with the area of skin below it to form the floor of the nose; excision of the scar and realignment of the vermillion margin.

Even after correction of the remainder of the deformity, as outlined, there still may remain a flattening of the side of the nose, the result of lowering and rotation of the tip. Although it has been suggested that this alar cartilage, which is usually concave externally, may be removed and replaced with its convex surface outward, we feel that the insertion of cartilage, either from the back of the ear or from the rib so that it just fills this flattened area, producing fullness comparable to that on the opposite side, is preferable.

In the cases in which deformity of the nose is associated with double harelip there is usually more marked deformity than in the cases of single harelip (Fig. 5*a* and *b*). Rounding of the bridge and tip of the nose, flattening of the anterior part of the vestibules, and shortening of the columella are characteristic. If the patient is a child this is best corrected by advancing the skin over the nose and lengthening the columella; if an adult, the cartilage in the region of the tip should be readjusted to stand forward as a tip. It may be necessary to remove a part of the nasal bone in order to correct the rounding of the bridge.

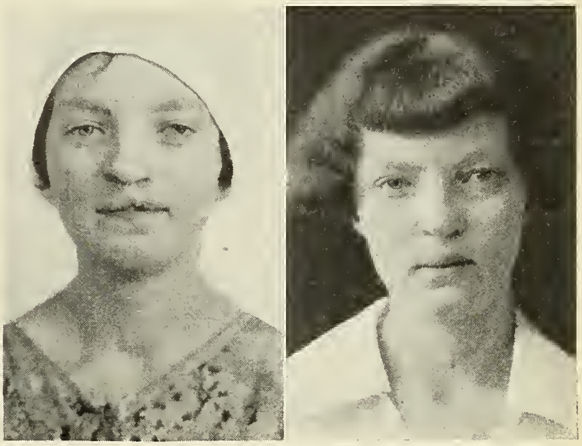


Fig. 2. *a,* Displacement of the median line of the nose to the right, with flared nostril, rolling of the margin of the ala and notching of the vermillion margin; *b,* the position of the nose in the median line; the deformity of the ala and vermillion margin has been corrected; the flattening of the left side of the nose has been corrected by means of a cartilage implant.

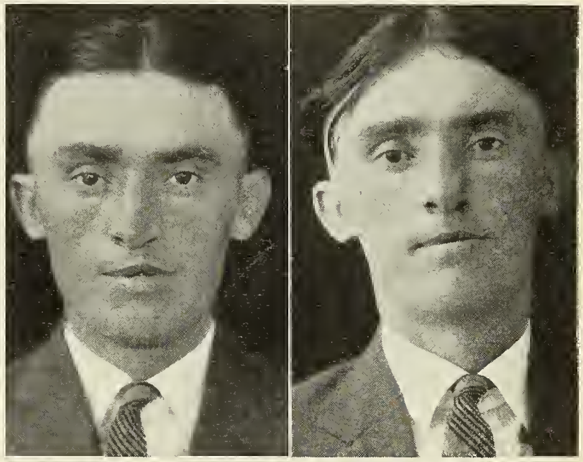


Fig. 3. *a,* The median line of the nose is displaced laterally; the lip is short and the vermillion margin is drawn up; *b,* the nose has been placed in the median line, the deformity of the lip and ala corrected, and the vermillion margin realigned.

The lip in most of these cases of postoperative deformity has to be lengthened or shortened, and the drawing up of the vermillion margin with notching corrected. The lip may be lengthened by making concave incisions, removing the scar down to a point laterally on the vermillion margin and then reapproximating the lip. In cases of double harelip the usual deformity of the lip is too much length from the columella to the vermillion border, and it may be necessary to remove a part of the tissue to correct the deformity. The vermillion margin may have to be rolled out on both sides and sometimes reconstruction of an entire new vermillion margin is necessary because of rolling out of the mucous membrane from the inside of the upper lip. If the nose and lip are scarred down to the jaw and the alveolar process, the use of Thiersch grafts on dental compound after excising this scar may be necessary to raise the nose and the lip. In older children and adults a dental plate may be used to fill in this newly formed pocket and to hold the nose and lip forward.

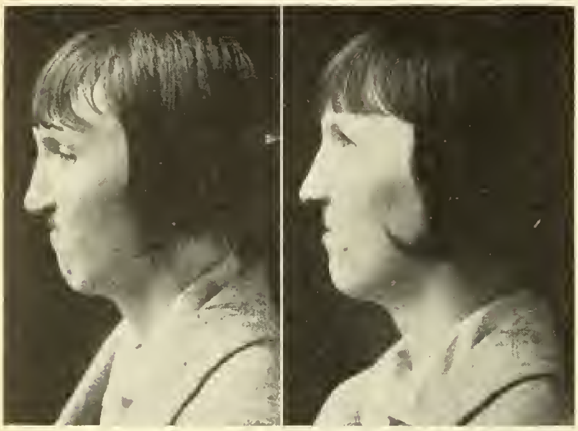


Fig. 4. *a,* Typical lateral view of patient with flattening of the upper lip, the result of forceful approximation of the alveolar process; the cartilage at the tip is lowered from the rotation of the nose; *b,* correction of the deformity, removal of the cartilage and insertion of a dental plate to hold the upper lip in correct position.

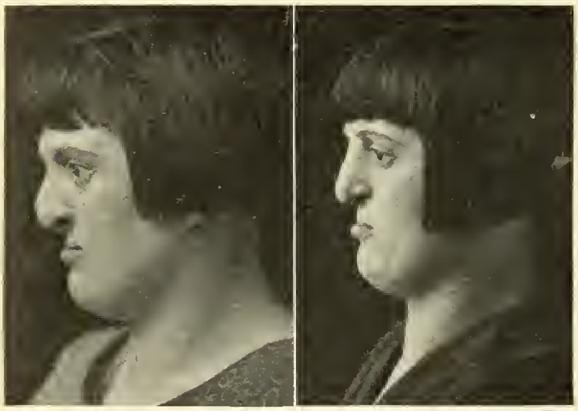


Fig. 5. *a,* Deformity resulting from double harelip; the rounding of the bridge and tip of the nose, with a short columella and upper lip, and the flattening of the upper lip may be seen; *b,* the lip has been lengthened, the cartilage of the tip of the nose has been readjusted so that a tip has been made, the hump has been removed and the columella lengthened; further removal of an elliptical piece, and rolling the lower lip inward would further correct the deformity.

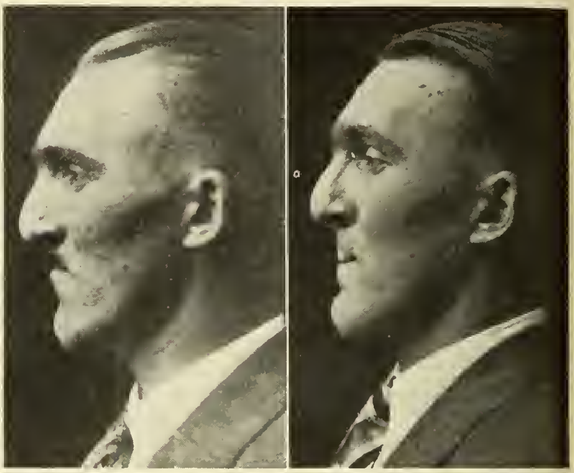


Fig. 6. *a,* Double harelip with loss of the premaxilla and part of the upper jaw; the upper lip is flattened and shortened; *b,* the loss of tissue in the upper lip has been replaced by turning up on a lateral pedicle a wedge-shaped piece from the center of the lower lip; rounding of the bridge of the nose should further be corrected.

The upper lip may be short laterally, due to loss of skin and mucous membrane from repeated operations. In this type of deformity a wedge-shaped portion of the full-thickness of the center of the lower lip is turned up on a lateral pedicle. The flap from the lower lip is sutured in the median line of the upper lip after excision of the scarring. It is necessary to feed the patient for about two weeks by means of a tube or catheter until the pedicle may be cut across and the suturing completed. This makes a satisfactory replacement of the skin and vermillion margin of the center of the upper lip. The deformity due to loss of the premaxilla and anterior part of the upper jaw is best corrected by means of dental appliances which hold the lip forward (Fig. 6*a* and *b*).

The correction of these secondary deformities usually requires much patience and ingenuity and sometimes multiple operations. Whether the deformity is small or great, it behooves the surgeon to do everything possible to correct it.

CARDIAC EMERGENCIES*

John M. Lajoie, M.B. (Tor.), M.D.
Minneapolis

IN AN organization like this Clinical Club, where each member is limiting his work to some special domain in medicine, all do not have the time or opportunity to become familiar with he various cardiac emergencies that may arise. I thought it would be of interest to review these alarming conditions. It has been a great help to me at times to quickly consider in tabloid form the various types of cardiac emergencies while getting ready to do something when face to face with a more or less alarming emergency.

First of all it is well to remember that symptoms of sudden onset referable to the heart are not necessarily associated with structural disease of that organ. I have in mind a woman I had in the hospital under treatment for a cardiac condition. She was very nervous and suddenly developed a sinking sensation in the region of the heart. She thought she was dying and sent for me and her family. When I arrived she was lying flat in bed with her eyes fixed and looking beyond the ceiling, her family were about her and everything suggested the approach of death. The skin was warm, the breathing was quiet and shallow, the pulse and blood pressure were normal and the heart showed no change. After I succeeded in assuring the family and the patient that death was not hovering about they all had a little laugh about the affair and the family went home.

In functional heart conditions the circulatory failure is not associated with any constant change in cardiac morphology. We are afforded help by the changes that occur in the circulation in parts of the body other than the heart. These changes help us to recognize the functional basis.

The exact nature of the changes in the dynamics of the heart which underlie the signs and symptoms of heart failure are as yet not clearly understood.

In a general way heart failure may be divided into two kinds: one in which the left side gives away functionally, and the other in which the signs and symptoms indicate that the right heart is affected. Failure of the auricles does not produce alarming symptoms, and there are many persons going about in apparently good health with their auricles functioning poorly.

The important symptoms present in left heart failure are: cough, usually worse at night, Cheyne-Stokes breathing, attacks of cardiac asthma and acute edema of the lungs. The physical signs that may be present are râles in the base of the lungs and difficult breathing. There are signs also of the underlying cause of the left heart failure, as hypertension and chronic nephritis, arteriosclerosis and luetic aortitis.

Very much different are the signs presented in right heart failure. They are cyanosis, pain and tenderness in the region of the liver, an enlarged congested liver, edema and effusion of the serous sacs, and scanty urine.

As an example of left heart failure may I call to your attention a patient I have under management for decompensation at the present time (C. E. T.). The patient has an aortic insufficiency due to lues, with the valves involved at their commissures near their attachment to the aortic wall. When there is evidence of aortic insufficiency one should always suspect syphilis. I will go further and say that if a person of middle age becomes decompensated for no apparent reason we must suspect syphilis.

As an example of right heart failure I will cite the case of a woman (Mrs. N. C.) who when first seen had a chronic heart condition, marked edema, cyanosis, ascites, large tender liver and scanty urine. Prompt paracentesis was indicated and done and followed by the usual cardiac management. The heart improved, the large liver became smaller, the urine increased but the ascites persisted, requiring paracentesis some ninety times. The tenderness and pain in the region of the liver was due to the acute stretching of the liver capsule, and is a very important early sign of failure of the right ventricle. Tenderness in the epigastrium and right hypochondrium may occur even before the liver is large enough to be palpable. Later, as the liver becomes chronically enlarged, the pain subsides and the liver becomes filled with connective tissue.

---

*Read before the Minneapolis Clinical Club, October 9, 1930.

Scanty urine is of more importance than albuminuria in indicating passive congestion of the kidneys. The edema that occurs in right heart failure tends to gravitate to dependent parts and it may disappear, but ascites and pleural effusion persist.

In auricular fibrillation the high auricular rate is the cause of the sudden circulatory embarrassment. In this condition the urgent need is to remove the load by slowing the ventricular rate. This is best accomplished by giving large doses of digitalis. A hypodermic of morphia helps to put the patient at ease and give much needed rest. It is a life-saver when the patient is so distressed he cannot remain in bed. I saw such a patient (Mr. P. D.) in consultation last year. He had auricular fibrillation and was so badly decompensated that he could not stay in bed. He had been in a chair for four days. Morphia for forty-eight hours made him comfortable in bed and with sufficient digitalis he improved so rapidly that he was symptom-free in a short time and has been about and apparently well ever since.

Besides proper medication, absolute rest, a simple light diet, restricted fluids and active purgation are indicated. Digitalis is of doubtful value in urgent cases of congestive failure with increased rate if the rhythm is normal. If done very early, venesection of ten or fifteen ounces of blood helps by lowering the pressure. If there is no digitalis in the system an intravenous injection of strophanthin gr. 1/250 in 40 c.c. of normal saline may be of benefit.

Auricular flutter illustrates a condition where the amount of blood put out by the heart has been shown experimentally to be diminished. In this condition the blood pressure is low, there is cyanosis and weakness. Since this is a shock type of failure, digitalis perhaps does more harm than good. It should be remembered, however, that digitalis is sometimes used in auricular flutter to change the rhythm responsible for the failure and not to treat the failure itself.

Mitral stenosis is a type of heart failure which has for its chief characteristics the inability of the heart to increase its output sufficiently to meet the ordinary demands of the body. The essential treatment is to limit the activity of the individual. Digitalis is of benefit if not depended on too much. It slows a fast heart, allowing the left ventricle to fill more completely during diastole and its stimulation of the left ventricle aids the peripheral circulation.

The advanced hypertensive heart is a type of heart failure which shows no evidence of any diminution of the cardiac output. The chief symptom is dyspnea occurring at night or after exertion. The blood pressure is high, the pulse full, the color is good and the extremities are warm. The symptoms do not suggest shock. In a hypertensive heart the ability of the right and left chambers to adjust their work to rapidly changing demands may be diminished so that the right and left ventricle do not coöperate well. When a call for increased work comes to such a heart the left ventricle is unable to respond. The right ventricle being able to respond increases its output so that a temporary congestion of the lungs follows this response, resulting in an attack of dyspnea. A hypodermic of morphia quiets the patient and perhaps reduces the cardiac output allowing normal coöperation between the right and left ventricle. Atropine should not be used as it increases the heart rate. Digitalis, if used, may diminish the frequency of attacks.

This brings us to acute edema of the lungs. The coughing of blood-stained serous fluid is indicative of very serious trouble in the pulmonary circulation. At the onset a small dose of morphia and 1/100 of atropine should be given. If there has been delay in giving the morphia and atropine, venesection of from fifteen to twenty ounces of blood is the only treatment likely to benefit the patient. When acute pulmonary edema is not due to cardiac insufficiency or to a pneumococcus or a streptococcus infection it may be due to localized angioneurotic edema or to some local vasomotor disturbance.

There is a paroxysmal dyspnea of cardio-renal patients that has the habit of occurring at night and is very alarming. If signs of respiratory infection are present, such as a bronchitis, the use of bronchial sedatives with inhalations will be very welcome to the patient. But if the patient is having Cheyne-Stokes type of breathing and shows no greater distress while lying flat than when propped up with pillows the breathlessness is due most likely to an acidosis due to the retention of renal insufficiency. Here again morphia will give immediate relief. A course of diuretin and three or four weeks in bed is the treatment to be carried out.

Another very alarming condition is one due to an embolism. When an embolism plugs a vessel carrying blood to the lung or one supplying the brain the symptoms produced are the result of the changes of the vascular supply to the infarcted area. When a clot is detached from the right auricular wall of a fibrillating heart it may lodge in the pulmonary vessel and cause dyspnea, hemoptysis, pleuritic pain and later pleural effusion, but, if the mural thrombus is from the left auricle the signs will be those of cerebral embolism or the occlusion of some other artery. Morphia should be used to relieve the distress and to insure complete rest. If pleuritic pain develops the affected side should be strapped with adhesive.

Cardiac syncope.—This is a sudden attack of unconsciousness which may be terminal, in which case treatment would be of no avail. Cardiac syncope may occur in persons who are apparently in good health. It may be caused by a plugged pulmonary artery, the occlusion of a coronary artery, or a ruptured ventricle or aortic aneurism.

There is a much larger group of cardiac patients who have less serious symptoms. In this group the syncopal attack is due to a sudden disturbance of the normal cardiac mechanism which results in a diminished cardiac output and low blood pressure which in turn causes a lessened supply of blood to the brain. These attacks are believed to have their origin in some disturbance of the vagus nerve and recovery is spontaneous when the vagus releases its control of the sinoauricular node. In this condition atropine in large doses is useful.

Another cause for a syncopal attack is the onset of complete heart block. Among the causes of heart block may be mentioned arteriosclerosis, syphilis, rheumatism and the improper administration of digitalis. The underlying condition should be sought and, when found, its proper treatment should be undertaken. It is well to remember that patients do not die from the conditions peculiar to heart block; they die from heart failure. The conduction changes resulting in heart block are sometimes produced by the vagus and a long interval of freedom from attacks may be obtained by the use of atropine. When there is complete auriculo-ventricular dissociation the syncopal attack may be controlled by intramuscular injections of adrenalin hydrochloride, which increases the rate and strengthens the contractions of the ventricle. Barium chloride, 30 mg. four times daily, has been used. It acts by increasing the irritability of the auricular ventricular bundle, and by raising the ventricular rate prevents standstill. I am not very enthusiastic about its use.

Digitalis may convert an incomplete block into a complete block, and therefore should not be used. But if a complete block exists, digitalis may be helpful. The presence of a Stokes-Adams syndrome is the only contraindication to the use of digitalis in complete heart block.

I wish to mention some other conditions in which syncope occurs as the result of diminished cardiac output and low blood pressure. I refer to paroxysmal tachycardia with a heart rate from 160 to 180 beats per minute and to auricular flutter where the auricular rate varies from 200 to 350 beats per minute. When the rate is so fast, the associated fall in blood pressure causes a diminished supply of blood to the brain and syncope. When the greatly increased rate is due to paroxysmal tachycardia, gradually increasing pressure on the right vagus nerve as it courses along the carotid sheath is effective in aborting many attacks. If the attack is of ventricular origin digitalis may help. I have seen quinidine used with apparent success. Auricular flutter, which is rare, may be the cause of the increased rate. It differs from true paroxysmal tachycardia in that the increased rate is practically always associated with failure of conductivity; *i.e.,* it is a two to one heart block. A persistent ventricular rate above 120 in elderly persons presupposes auricular flutter. Full doses of digitalis are used to change auricular flutter into auricular fibrillation and finally into a normal rhythm.

A very alarming emergency that happens too often in the operating room is that of cardiac arrest. It is unsuspected and unforeseen. Cardiac arrest in the operating room is either primarily cardiac or secondary to vasomotor relaxation. Cardiac failure secondary to vasomotor relaxation may be suspected by frequent blood pressure readings during anesthesia. By intravenous injections of fluid the pressure may be maintained and cardiac arrest prevented. If cardiac arrest has occurred one must work quickly and restore cardiac rhythm before six minutes has elapsed. The success of treatment usually depends on the operating room staff being ready for the emergency. First give a solution of 1-50,000 adrenalin in normal saline into the left common carotid artery. Give about 200 c.c. If this fails an osteoplastic flap made through the chest wall will allow the operator to do cardiac massage, which is successful in about 25 per cent of the cases. It is well to remember that cardiac stimulants are rarely successful if the circulation has ceased.

Both types of cardiac arrest are probably associated with ventricular fibrillation.

Of all the causes of cardiac syncope none compare in seriousness with that of fibrillation of the ventricle. It is a terminal event and there is nothing we can do to help the patient. It is the cause of death in early chloroform anesthesia. It may terminate a Stokes-Adams syndrome. It occurs in persons taking digitalis or quinidine, and it may occur in apparently healthy persons. This emergency may never arise if we keep it in mind and are careful. Digitalis should be discontinued in treating auricular fibrillation if there is a slow bigeminal pulse. Strophanthus should not be given intravenously in larger doses than gr. 1/250 in a twenty-four hour period and should not be given at all if there is digitalis in the patient's system. Quinidine should be reserved for selected cases which are at rest in bed and under careful observation.

There are some other forms of shock having cardiac signs or symptoms. They are the heart failures that occur in acute infections and those associated with pregnancy. Since they are not associated with any definite pathological condition and are not primary heart conditions nothing more will be said about them.

In conclusion, since we now have on our finger tips the various forms of cardiac emergencies, there will be times when there may be some doubt in our minds as to the correct diagnosis and the best remedy to employ. While making a mental study of the presenting symptoms we can be of help if we keep in mind two important factors: namely, to establish self-control and confidence in the patient, and to bring about spontaneous relaxation following exhaustion. To quiet the nervous system and relax the spasm nothing is so helpful as a hypodermic of morphia and atropine. The atropine is used to prevent depression. Have the patient recline on some pillows. For quick momentary action smelling salts serves a purpose, or a tablespoonful of whisky in twice the amount of hot water. Hot coffee by mouth, if the patient can take it, is excellent, and may also allow the belching of gas. If collapse, dyspnea, low blood pressure or cyanosis is present, ergot may be injected into the muscle with good results.

In closing may I say a few words about digitalis, our best heart remedy? It was first brought to the attention of the medical profession by Withering in 1785. Its best therapeutic effect is obtained by using the standardized tincture which combines all the qualities of the various isolated principles. When digitalis is employed in therapeutic dosage where there is a disturbed cardiac mechanism it produces decreased conductivity of the auricular ventricular node, causing a slower pulse, and it increases the force of the ventricular contraction. In other words it lengthens and strengthens cardiac systole, causes an increase in pulse force and raises arterial pressure.

No definite limit can be placed on the amount of digitalis necessary to produce and maintain a desired physiologic result. When the drug is given in large doses it is essential that the patient be carefully watched and that it be discontinued on the appearance of symptoms of physiologic intolerance concerning which Withering said, "Let the medicine be continued until it either acts on the kidneys, the stomach, the pulse or the bowels; let it be stopped upon the first appearance of any one of these effects."

612 Medical Arts Building.

DIFFERENTIAL DIAGNOSIS OF ENDOCARDITIS*

Harry L. Smith, M.D.
Rochester, Minnesota

THE clinical types of endocarditis may be subdivided as follows: (1) acute bacterial endocarditis, (2) subacute bacterial endocarditis, and (3) rheumatic endocarditis: acute rheumatic endocarditis, recurring rheumatic endocarditis, and chronic rheumatic endocarditis.

In the majority of cases, when a diagnosis of endocarditis is established, the particular type is not difficult to determine. This is especially true of the typical cases (Table 1); in the atypical cases considerable difficulty is encountered at times in differentiating the types.

Subacute bacterial and acute and recurring rheumatic endocarditis are the types that are likely to be confused, and they cause the most difficulty in diagnosis. Occasionally, a fulminating type of subacute bacterial endocarditis will closely resemble acute bacterial endocarditis. This paper will not include a consideration of chronic rheumatic endocarditis.

ACUTE BACTERIAL ENDOCARDITIS

This condition was known to older writers as endocarditis lenta, and as malignant, ulcerative, septic, or septic bacterial endocarditis. Clinically, acute bacterial endocarditis is not as important from a cardiac standpoint as the other two main groups.

Staphylococci and streptococci, *Neisseria gonorrhea* and *Diplococcus pneumoniæ* are the organisms most frequently responsible for the disease. Cases have been reported that were due to *Eberthella typhi* (typhoid bacilli), *Mycobacterium tuberculosis, Bacillus anthracis, Corynebacterium diphtheriæ, Neisseria intracellularis* (meningococci), and *Escherichia coli* (colon bacilli).

There is a greater variance of opinion concerning the incidence, symptoms and mortality of gonorrheal endocarditis than concerning the other types of acute bacterial endocarditis. Gonorrhea is not a common cause of heart disease, as is illustrated by the fact that Cabot failed to find a single case with this etiology in 1906 postmortem examinations in cases of cardiac disease. It is often stated that gonorrheal endocarditis is less acute and not as malignant as are the other types of acute bacterial endocarditis, but in the proved cases it would appear that gonorrheal endocarditis is about as fatal as are the other forms of acute bacterial endocarditis.[10] Gonorrheal endocarditis is a direct result of gonorrheal septicemia, just as the other types of acute bacterial endocarditis are results of general septicemia or bacteriemia. Acute bacterial endocarditis, compared to the other types of endocarditis, is relatively rare.

Vegetations are practically always present in acute bacterial endocarditis, and usually there is loss of substance of the valves, in varying degrees, that frequently leads to perforation of a leaflet. The deeper structures commonly share in the process. The mitral valve is the one that is most commonly involved. Involvement of the aortic valve occurs next in frequency, and invasion of both aortic and mitral valves occurs with less frequency. The tricuspid valve alone is rarely affected.[9,11]

It is difficult to reconstruct a satisfactory clinical picture of acute bacterial endocarditis. Previously injured valves are more likely to be involved than normal valves. The objective cardiac evidence may be that of healed rheumatic endocarditis. In the majority of cases the cardiac symptoms are only a part of the picture of generalized infection, and evidence that the heart is involved often is masked by the patient's critical general condition. Embolism is a frequent complication, and this often is the first positive proof of the cardiac involvement. The usual clinical picture in this group of cases is that of severe septicemia or bacteriemia. As a rule these cases run a course varying in length from a few days to a few weeks, and are practically always fatal.

As has been stated in the foregoing, subacute bacterial endocarditis, and acute and recurring rheumatic endocarditis, are the types that are most difficult to differentiate and they are the cases that merit special consideration.

---

*From the Section on Cardiology, The Mayo Clinic, Rochester, Minnesota. Submitted for publication January 21, 1931.

Table 1

DIFFERENTIAL DIAGNOSIS OF (ACUTE AND RECURRING) RHEUMATIC ENDOCARDITIS AND SUBACUTE BACTERIAL ENDOCARDITIS

	Subacute bacterial endocarditis	Rheumatic endocarditis (acute and recurring)
Etiology	*Streptococcus mitior* (viridans)	Rheumatic fever, chorea, tonsillitis (streptococci)
Incidence	0.5 to 1 per cent of all cardiac diseases	18 to 20 per cent of cardiac diseases (including chronic)
Sex	About equal numbers of males and females	More common in females
Age	Occurs in older group 5-10 years	Begins usually with patients less than 30 years of age
Leukopenia	May occur	Rare
Leukocytosis	Rare, unless sepsis present	About 50 per cent of cases
Anemia	Slight in the early stage; later, usually marked and progressive	Rare and slight if present
Petechiæ	Common	Absent, or rare
Nephritis	About 50 per cent of cases; Higher in late stages Albumin; erythrocytes; high value for blood urea is rare	Absent
Osler's nodes	Common	Rare
Janeway's nodes	Occurs, but not common	Absent
Infarction	Common	Absent or very rare
Purpura	Rare	Absent
Severe, diffuse, cutaneous lesions	Very rare	Absent
Temperature	Usually continuously above normal and often septic in type	Usually increased and intermittent
Spleen	Usually enlarged	Normal
Physical signs	Usually those of chronic valvular heart disease	In recurring type, those of chronic valvular heart disease
Auricular fibrillation	Rare	Common
Pericarditis	Rare	More common than other group
Course	Fatal, usually in two years	Tendency to recover with valvular defects
Involvement of joints	Absent or rare	Common
Acute myocarditis	About 23 per cent of cases that come to necropsy	88 to 100 per cent of cases that come to necropsy

ACUTE AND RECURRING RHEUMATIC ENDOCARDITIS

The etiology of rheumatic endocarditis is rheumatic fever. It should be emphasized that rheumatic fever is an infectious disease that is almost as widespread and extensive as syphilis and tuberculosis. It is fairly well agreed by the best authorities that rheumatic fever is due to infection with streptococci. In eliciting a history relative to the heart, it is a universal practice to ascertain whether or not the patient has ever had rheumatic fever, chorea, tonsillitis, scarlet fever, or "growing pains." In the majority of cases a definite history of rheumatic fever is obtainable. In other cases a positive history of chorea, tonsillitis, scarlet fever, and growing pains will be obtained. Growing pains are not always significant, but as Swift well pointed out, their occurrence in children, with infection, should be viewed with concern. It is becoming more evident, and in time there may be little doubt, that chorea, tonsillitis, and in certain instances, growing pains, are different clinical phenomena of that diffuse and extensive disease known as rheumatic fever. I do not believe that the common and acute follicular tonsillitis is often an etiologic factor in the production of endocarditis, but the tonsillitis that is part of the picture of rheumatic fever is a very important factor. Up to the present time these types of tonsillitis are not satisfactorily differentiated. Halsti, in his carefully controlled histologic studies, has shown that there are marked inflammatory foci in all types of diseased tonsils, but that in the tonsils of patients with rheumatic polyarthritis or heart disease there occur more intense mural changes in arteries of medium size than are found in tonsils from patients with other diseases. Rheumatic endocarditis is more common in females than males. The disease usually makes itself manifest before the age of twenty-two years. It is rare for this disease to have its onset after the age of thirty-two years.

Table 2

DISTRIBUTION OF LESIONS IN 109 CASES OF RHEUMATIC ENDOCARDITIS

	Acute	Chronic	Total	Per cent
Mitral valve	42	57	99	90.8
Aortic valve	20	43	63	57.7
Tricuspid valve	19	26	45	41.0
Pulmonic valve	3	1	4	3.3
Myocardium	46	28	74	67.8
Pericardium	7	34	41	37.5

The early pathologic changes that occur are infiltration, induration, and edema of the cusps, and these changes may be restricted to a small area or they may be diffuse.[12]

The vegetations in the rheumatic group of endocarditis are small, rather firm, fairly smooth, globular or warty in appearance, and occur more often at a point of contact and on the free margins of the valves. They may be attached by pedicles of varying lengths.[11] The left side of the heart is more often involved than the right. Van Glahn, in a series of 109 cases, found the distribution of the lesions as given in Table 2.

The early vegetations are composed of bacteria, blood platelets, leukocytes and fibrin in varying degrees. The Aschoff body is characteristic of this lesion. It is described as a minute nodule, composed of wandering cells concentrically arranged, scattered throughout the heart wall and especially in relation with small arteries.[9] The vegetations are later replaced by connective tissue. The affected valves may be restored practically to a normal condition, or the process may extend to ulceration. The vegetations in this type of endocarditis rarely form emboli, and some writers go so far as to say they never do. In most instances, the valvulitis extends on to varying degrees of scarring and deformity.

Many theories are advanced concerning just how and when the initial lesion occurs. The three most probable sites are given as (1) the covering of the endocardium, (2) tissue in and about the blood vessels of the valves, and (3) the valve rings, from foci situated in them.[12]

The clinical course and physical features of acute and recurring rheumatic endocarditis often are not very definite or characteristic, and for this reason they are frequently overlooked.

In a case of rheumatic fever, whether it is the first siege or whether it is a recurring attack, if the patient becomes more toxic, if pulse and temperature rise in the presence of increasing pallor and without sufficient cause (that is, if the involved parts do not become aggravated) one should be suspicious of involvement of the endocardium. The objective cardiac signs that may appear early in the disease are slight roughening of the first sound at the apex, heart tones that are rather weak and lack definition, and often gallop rhythm. The roughening of the first sound may develop into a definite murmur.

Leukocytosis is present in about 40 to 50 per cent of the cases. As a rule, leukocytosis does not aid materially in distinguishing acute and recurring rheumatic endocarditis from subacute bacterial endocarditis. It is more common in acute and recurring rheumatic endocarditis. Leukopenia is extremely rare. Anemia, in contrast to leukopenia and leukocytosis, is a very important factor in the differential diagnosis of subacute bacterial and acute and recurring rheumatic endocarditis. Mild secondary anemia is not uncommon in acute and recurring rheumatic endocarditis, but is rarely as severe and progressive as it is in the subacute bacterial type. The same may be said concerning leukopenia as has been said concerning leukocytosis; that is, it is not a very important differential feature. Joints are involved in about 90 per cent of the cases at some stage of the disease. Nephritis in acute and recurring rheumatic endocarditis is extremely rare, whereas it is a common complication in subacute bacterial endocarditis.

SUBACUTE BACTERIAL ENDOCARDITIS

The term "subacute" is not entirely satisfactory, but up to the present it more accurately describes the condition than any other term that has been presented. The term "acute" cannot be used because some of the patients live about two years. The term "chronic" is inapplicable because some of the patients may die within a month or so, and too, the term chronic well describes the scarred and deformed valve of rheumatic endocarditis.

Subacute bacterial endocarditis is practically always the result of *Streptococcus mitior (Streptococcus viridans).* Libman found *Hemophilus influenzæ* (influenza bacillus) present in a higher percentage of his cases than has been found at The Mayo Clinic, where *Hemophilus influenzæ* has been found in only one case, and this case belonged to the acute rather than to the subacute bacterial group.

Subacute bacterial endocarditis practically always involves valves that have been previously injured, and the injury, in the majority of cases, has been due to previous rheumatic endocarditis. Occasionally the injury may be the result of a congenital defect, arteriosclerosis, or syphilis. The distribution of valvular lesions, that is, the order of frequency of valvular involvement, is essentially the same in the other forms of endocarditis.[4] Active pericarditis is very rare in subacute bacterial endocarditis. It occurs much more commonly in the rheumatic group of cases. The gross vegetations in this group are larger and more irregular than in the rheumatic group; they are soft, villus-like, and are not as smooth as the rheumatic vegetations. It is common to find several chordæ tendinæ severed.[9, 11]

The urine in this group of cases usually contains some erythrocytes, albumin, and occasionally casts, but as a rule renal function remains good up to the late or terminal stage.

The types of nephritis in subacute bacterial endocarditis are more interesting from a pathologic than from a clinical point of view. One of three types of nephritis may be associated with subacute bacterial endocarditis: (1) embolic nephritis, in which the kidney contains multiple small abscesses but has relatively good renal function; (2) diffuse nephritis that is due to gross infarction, and (3) diffuse subacute glomerulonephritis. In a small percentage of cases, all the glomeruli will be involved, and microscopically the condition looks like that seen in true diffuse glomerular nephritis.

If the concentration of urea in the blood rises to 250 or 300 mg. in each 100 c.c. before death, usually one can predict, with a fair degree of accuracy, that diffuse subacute glomerulonephritis will be found at necropsy.[2]

Baehr described the salient features of the glomerular lesions as "involvement of one or more loops of a variable number of glomeruli and an absence of any visible disease in the uninvolved portions of the affected glomeruli."

These patients usually look sick, and as a rule they are. Their temperature usually is continuously above normal, and it is often septic in type. There are afebrile stages that have been described. The patients may have pain that involves the muscles and joints. As a rule, however, the pain is not severe, and the regions of involvement are not so extensive as in the rheumatic group of cases. The objective cardiac findings are usually those of preëxisting valvular disease.

Petechiæ are common. They occur on skin and mucous membranes. Most often they occur on the anterior surfaces of arms, hands, and body. The conjunctiva of the lower lids is a very common site of petechiæ, and their occurrence in this region is almost pathognomonic of the disease. Petechiæ on the conjunctiva usually occur singly, and have a creamy-white center. The petechiæ occasionally occur in groups or showers. They may be present for a few days and then disappear, to be followed by another shower. They may be numerous or there may be just a few in scattered areas.

Janeway's lesions are not common, but do occur. They are described as small, slightly nodular hemorrhagic lesions, not tender, and occurring principally on the palms of the hands and the soles of the feet.[14]

Rheumatic nodules, originally described by Meynet, are also known as Osler's nodes. Osler described them as small, firm, hard subcutaneous nodules, that vary in size from that of a small shot to that of a large pea, and which occur most frequently on fingers, hands and wrists. They may occur on the elbows, feet, knees and back. As a rule, they are distinctly tender and painful. They may last from a few days to a few weeks, and even months. They are made up of round and spindle-shaped cells.

Purpura may occur, but it is rare. A few cases in which there were severe, diffuse, erythematous lesions have been described.[5] Judging from the duration of the clinical course of the cases reported in which these erythematous lesions have occurred, it appears that they should be classified with the cases of acute bacterial rather than with the cases of subacute bacterial endocarditis. Infarction of the spleen, kidneys, and brain is common. Anemia is present and usually is marked and progressive. Leukocytosis is very rare unless sepsis is present. Leukopenia occasionally occurs. Active pericarditis is rare in subacute bacterial endocarditis, but scarring due to preëxisting pericarditis is fairly common. Auricular fibrillation is very rare in subacute bacterial endocarditis,[8] but common in the recurring rheumatic form. Splenomegaly is present in the majority of cases. It occurred in only 46 per cent of Clawson and Bell's cases. Fox, in his pathologic studies, found infarct to be the most important gross lesion in the spleen, and perisplenitis was present in practically every case. He found further that the enlargement of the spleen was due mainly to the infarcts, generally hyperplasia, and increase in the amount of blood.

Positive blood culture is present in about 85 to 90 per cent of the cases, and in the atypical cases this is probably the most important factor in making a diagnosis.

BIBLIOGRAPHY

1. Baehr, George: Glomerular lesions of subacute bacterial endocarditis. Jour. Exper. Med. 15:330-347, (April 1) 1912.
2. Barker, Nelson: Personal communication to the author.
3. Cabot, R. C.: Facts on the heart. Philadelphia, W. B. Saunders Company, 1926, 781 pp.
4. Clawson, B. J., and Bell, E. T.: A comparison of acute rheumatic and subacute bacterial endocarditis. Arch. Int. Med., 37:66-81, (Jan.) 1926.
5. Davis, David, and Ayman, David: Subacute bacterial endocarditis with unusual vesiculobullous skin lesions. Necropsy reports on two cases. Am. Heart Jour., 2:671-681, (Aug.) 1927.
6. Fox, Herbert: The changes of the spleen in subacute bacterial endocarditis. Arch. Path., 10:402-406, (Sept.) 1930.
7. Halsti: Quoted by Swift.
8. Libman, Emanuel: Characterization of various forms of endocarditis. Jour. Am. Med. Assn., 80:813-818, (March 24) 1923.
9. MacCallum, W. G.: A textbook of pathology. Philadelphia, W. B. Saunders Company, 1928, 1177 pp.
10. McCants, J. M.: Gonococcus infection of heart—with a report of two fatal cases due to a gram-negative diplococcus. U. S. Nav. Med. Bull., 28:603-616, (July) 1930.
11. Osler, William: The principles and practice of medicine. Ed. 11. New York, D. Appleton and Co., 1930, 1237 pp.
12. Swift, H. F.: Rheumatic fever. Jour. Am. Med. Assn., 92:2071-2083, (June 22) 1929.
13. Von Glohn, W. C.: Rheumatic disease of heart. Arch. Path. and Lab. Med., 3:355-356, (Feb.) 1927.
14. Willius, F. A.: Subacute bacterial endocarditis. Southwestern Med., 8:203-205, (May) 1924.

NAME OF NARCOTICS DIVISION CHANGED TO DIVISION OF MENTAL HYGIENE

In a recent report, Surgeon General H. S. Cumming of the Public Health Service indicates that the year ended June 30, 1930, has been characterized by additional legislation seeking to coördinate and crystallize the functions of the Narcotics Division, now designated by law as Division of Mental Hygiene.

At the close of the year, the functions of the Division of Mental Hygiene, in the office of the Surgeon General, included the administration of the two recently authorized United States narcotic farms; studies and investigations of the nature of drug addiction and the best methods of treatment and rehabilitation of persons addicted to the use of habit-forming drugs; the dissemination of information on methods of treatment and research in this particular field; coöperation with State and local jurisdictions with a view to their providing facilities for the care and treatment of narcotic addicts; the supervising and furnishing of medical and psychiatric service in Federal penal and correctional institutions; studies and investigations of the abusive use of narcotic drugs and the quantities of such drugs necessary to supply the normal and emergency medicinal and scientific requirements of the United States; and, lastly, studies and investigations of the causes, prevalence, and means for the prevention and treatment of mental and nervous diseases.

The site for the first United States Narcotic Farm has been selected at Lexington, Kentucky, and plans are under way for the development of the necessary buildings thereon. Medical officers have been assigned to the medical and psychiatric clinics established at the several penal and correctional institutions.

AN UNEXPLOITED THERAPEUTIC OPPORTUNITY IN PERIODIC HEALTH EXAMINATIONS OF YOUNG ADULTS*

Norman Johnson, M.D.
Minneapolis

THE following paper presents certain ideas which have crystallized out from time to time in meditations over a type of problem seen frequently by internists, the answer to which problem seems never to have been attacked in any organized way either in medical education or to any degree in the literature. The reason why we do not cope well with these problems in our education is chiefly because we are so ignorant,—ignorant of the factors involved and especially ignorant of how to cope effectually with such of the factors as we do partially understand. Then too, we are, as a branch of science, very prone to investigate, to show a studious interest in, and to teach, only subject matter which can be proved in a test-tube, reduced to a mathematical formula, or is otherwise susceptible of laboratory methods of examination. Such a tendency is unfortunate, but it is a line of least resistance and therefore one which will probably be continued. It falls down in clinical practice because the human being cannot be reduced to a mathematical formula or a test-tube reaction.

These are the clinical events which prompted my subject for this paper. In one period of ten days during the past year I had to advise four men that they abandon all business immediately for a period of time, varying from a few days to four months. One was a lawyer whose chief complaint was right upper quadrant colic for which pathology could not be demonstrated—a functional spasm perhaps. Another was the business physician for one of the largest lumber interests in the country,—the man on whom the business difficulties eventually were unloaded for settlement. He had reached a point where he would break into a profuse perspiration on trying to open a window, and he admitted that to put his head out of the window and scream would have afforded him considerable relief. The third man was one of a firm faced with insolvency. He came to me because he could not sleep except with sedatives, and then not more than four hours a night. He was losing weight, becoming very nervous and irritable, and during a few weeks time his blood pressure mounted twenty points to 160 systolic. He was able with guidance to close out his business without a break in compensation. A new business venture was successful for a time. During this period, he slept well without drugs, gained weight, lost his nervousness, and experienced a drop in blood pressure, but with the business depression last Spring, difficulties again developed and the whole syndrome, augmented by transient paling of finger tips, loss of appetite, despondency, and sweating, recurred. He could not talk about his business without tears. Thyroidism was suspected but could not be proved. He could not sleep even with drugs. During this period the blood pressure elevation reached 190/110. A vacation of four months was insisted upon. He closed out his business and when last heard from was markedly improved in every way except financially. The interesting corollary is that his brother—a business partner—went through the same experiences without having to consult a doctor. What is the difference in these two men? It is of course the difference in what we label "temperament"; it is the difference in equanimity or in mental serenity while under pressure. The one, through his thoughts, fears, blasted hopes, worries, disappointments, upsets the balance in his vegetative nervous system with resultant physical symptoms. The other went through the same experience and was still able to carry on at the time he most needed to carry on.

These are the simpler types of cases which seem clean cut. To carry the concept of symptom-etiology further into pseudo-clinical entities is a procedure fraught with danger and difficulty. The possibility of the existence of true physical disease in spite of inability to prove its actuality will always remain to plague the diagnostician with doubt. To illustrate: the head of a large mercantile establishment has had four attacks of acute right lower quadrant pain closely resembling appendicitis. All of these attacks have disappeared after twenty-four to thirty-six hours of rest in bed. I have not yet felt fully justified in advising operation in any attack, chiefly because I know his temperament rather well and suspect he may be producing these attacks himself. In support of this belief is an X-ray diagnosis of spastic colon. I also see him occasionally for attacks of extrasystoles which he may well bring on himself through a state of high nervous tension. As a parallel case, I have that of a music teacher who taught fifty-four music pupils a week, became engaged, married—with all the social obligations attendant thereto—did her own housework, and, following a period of great excitement one evening, developed acute epigastric pain, vomiting and some diarrhea. After thirty-six hours, the pain localized in the right lower quadrant, the leukocytes reached 13,000 (note vomiting and diarrhea) and a surgical consultant thought he could palpate an appendiceal abscess. Operation revealed a normal appendix and no explanation for the pain or vomiting was forthcoming. However, right lower quadrant pain severe enough to require day and night special nurses continued for three weeks after operation.

---

*Read before the Minnesota Society of Internal Medicine, Rochester, November 10, 1930.

Now none of these patients, except the bride, was neurotic or hysterical. If any practice contributes four cases in ten days of any one condition sufficiently severe to disable a patient, that condition must be an important factor and worthy of reflection. If there are cases producing disability, there are many more of lesser degree. In other words, organic dysfunctions not due to disease, hysteria, or neurosis must be fairly common in life, and the internist will be the logical one to see many of these cases. I believe that a large percentage of our working population are potentially cripples or may become so under a given situation or succession of adverse circumstances. I have asked myself time and again,—why do we have these physical manifestations of dysfunction? What can we do to prevent them?

The answer to the first question is obvious. So far as our motor and secretory functions are concerned, we are all controlled by a vegetative nervous system. Much has been said and written, but little is actually known, about this control. We know that, with a few exceptions such as bladder and rectum, these functions are beyond control of the will, but they are very much influenced by emotional stimuli. We have heard of the vasotonic and sympathetico-tonic types of individuals, but these labels connote an inherent or inborn imbalance of the vegetative nervous system and comprise only a small group of the total population, whereas I believe that a great many of us actually develop a very hair-trigger mechanism to all autonomic reactions.

One recent piece of physiological research may have bearing as evidence in incriminating the autonomic nervous system as a source of disability. In working on conditioned reflexes in dogs, attempt was made to quantitate the response to stimuli. Interpretation of results seemed to show that where the stimulus was pleasurable, repetition over longer periods seemed to cause progressively diminishing response (saliva containing less solids and of lower specific gravity) whereas if repetition of unpleasant stimuli was tried, intensification of the reflex action seemed to increase with the same strength of stimulus. If true, this may be exceedingly important to the human undergoing recurrent unpleasant experiences.

There are many disease entities of unknown etiology which might with some justification be assigned as to origin to a disturbance, prolonged over many years' time, in the delicate adjustments affecting motility, secretion, or irritability of organic structures. Such a group might include the primary disorders in vascular control such as Raynaud's coronary disease, hypertension, or angio-neurotic edema. It could also be extended to include diseases due to sudden change in the vascular flow, such as certain headaches, epilepsy, periodic amblyopia, abdominal migraine, acrocyanosis, hay fever, and many gastro-intestinal complaints. In the same related group might also be placed asthma, exophthalmic goiter, Hirschsprung's disease, spastic constipation, certain diarrheas, and even ulcer and diabetes. If entities such as these may be related to imbalance in vegetative control, then there must be also a large group of symptomatic difficulties with a similar basis in etiology that can attack the human, even to the degree of complete disability. This I believe to be the cause of at least some of the disabilities in the cases mentioned,—which brings me to the second query—What can be done about it?

To attempt to change the habits of thought, or the state of mind or of temperament, in a man or woman of forty-five is not easy. It may not even be possible. I would rather attempt to change his religious or political prejudices. In each of the cases mentioned, the end-result was satisfactory and yet the treatment was only palliative—which is not the highest goal of therapeutic achievement. What *can* one do? He may give advice to stop worrying, which doesn't stop the worrying. He may comb the body for foci on which to put the onus of symptoms. He may give sedatives, or medication designed to alleviate the presenting symptoms, just as he may give insulin to the diabetic, which will not often cure the diabetes though symptoms are relieved. Or, better yet, he may attempt to strike prophylactically at the source.

This is now the fifth year that I have had the pleasant experience of making periodic health examinations on students at the University. Except for some entering freshmen in the past two years, these are graduate students. They fill out an extensive questionnaire, have performed a very complete set of routine laboratory tests and come to the physician for a thorough physical examination and a survey. The defects in habit or physical equipment, and all symptoms complained of, are discussed and appropriate advice given. One hour for each student is the allotment with the physician. Some require less time; some a great deal more. It is in talking with and studying these students that many illuminating and thought-provoking problems occur. Together with a great many other things, I am sure I can find amongst this selected group of approximately healthy beings, the prototypes—the anlage if you will—of the type of person mentioned before. These defects which, under given conditions, may produce disability, or unhappiness, are not necessarily a heritage. More frequently, the student himself develops the mental state which makes him so vulnerable to the buffets of a competitive and sometimes cruel life ten or twenty years later. It is my belief that mental reaction habits are formed during school years, along with a great many other reactions to which a person by constant and daily repetition becomes habituated. For instance, most students have early formed the habit of washing their faces in the morning—a simple thing—and yet it has become so much a part of their lives that to remove this daily ritual would make them decidedly uncomfortable—for a time at least. Likewise, they are forming or have already formed habits of study, of eating, of sleeping, of defecation, of exercise, all of which they will continue as they have begun unless something interrupts the habit-continuity. If this is true, it should be profitable to enlist the intelligence of the youth himself toward making some definite attempt to shape up a group of habits which will not leave him vulnerable later. Better steer a course than float blindly with the stream. From the time he leaves the pediatrician, and discards his blind allegiance to parental advice, until he finds himself in trouble, there is no one making any organized attempt to train the individual toward the ability to remain serene under adversity or pressure. This is a period of twenty years or more, and when it is over, whatever has been put together by haphazard methods is so thoroughly "gelled" that it cannot be undone if it is bad. All of which is one reason why so many excellently trained and talented men and women are prevented by their own temperamental limitations from accomplishing anything "big." They "crack up" under pressure because they do not know how to use their capacities to fullest advantage.

There is no science to aid the physician who attempts to guide the youth in developing what I have called mental serenity. Perhaps the Christian Scientists do it passingly well. Osler, in a little essay delivered to the Yale students called "A Way of Life," has told how he worked out his own salvation to permit him to accomplish a very busy life without physical disaster. He also has written his famous essay on equanimity. These furnish the germ of the idea which I am trying to present, *i.e.*, of the necessity for making an effort to develop, along with other developments, the ability to handle oneself. If a man spent one quarter of the time and effort which he uses to make his business efficient toward making himself a smoothly running machine, there would be fewer casualties and more genius available.

The earlier a beginning can be made in such training, the easier obtained the results. I speak from an experience only with students, which is a select group having distinct and specific problems not occurring in the world at large. Yet the general reactions of nervous excitability, of too great intensity, over-conscientiousness, and self-consciousness, are present everywhere, and the stimuli which serve to aggravate them may be found in one form on the campus and in another in the shop. Only, I believe, the more highly organized the intelligence, the greater the susceptibility to overstimulation. Hence the college campus should furnish more material per capita than the industrial plant.

The specific points to be emphasized in the hope of creating an intelligent awakening in the student toward what he is doing may be only mentioned in passing. Each person presents a different combination, and each needs an individualized approach. One of the numerically greatest of the habits which I ask the student to consider is that of a highly developed sense of duty coupled with a false standard of values—the conscientious student. He, or usually she, received high marks in high school where effort and conscientiousness receive their reward in grades. In the University, this student is just another Ford being put through the factory, and grades are issued impersonally on the basis of an examination which may have created such a psychic response in this particular student at the time it was given as to result in a poor grade. Then the next examination is worse and I have repeatedly seen students of eighteen with constant pulse rates over 100, blood pressure near 160 systolic, even at rest, who admit to being paralyzed with fear at each successive examination. The fault here is the universal emphasis on the importance of the grade as an index of the efficacy of time spent in college. No one yet has been eminently successful in life because of high marks in college, but many have failed in life because, in striving over four to twelve years for high grades, they have only learned the ability to get out of control—vegetatively speaking. So I try to teach them, if conscientious, that it is important to know when to be and when not to be conscientious.

Then there are the high degrees of self-consciousness, always coupled with a high degree of instability in the vegetative nervous system. Four years of improper handling in college may clinch for this student a reaction habit which will end in his downfall when put under pressure. For instance, one senior dentist told me that, as a freshman seven years before, he was so self-conscious that he would go many blocks beyond his car-stop before he could bring himself to push the button. Imagine this man thrown out into the business world! How vulnerable he would be to physical catastrophe! This type I usually send to the mental hygienist. They are very difficult.

Again there is the boy who must, outside of school, work forty hours a week in order to support himself in graduate school. The mere situation of being constantly behind day after day, of being constantly pushed for time between his job, his classroom, his studies, meals and sleep—always at the expense of outdoor relaxation—creates in a few months' time a state of sustained intensity. They are always tense. Blood pressures and pulse rates are frequently elevated. In life afterward they will be the high-pressure big-business men and perhaps will die of coronary disease at fifty. This type needs to be taught the value of artificial relaxation, of utilizing short snatches of time for turning off the switch, and that is a very difficult thing to learn—how to turn off the switch. Especially they must learn Osler's dictum of living in water-tight and air-tight compartments of twenty-four hours each, and of not projecting themselves into the mass of work waiting to be done until it is time to be there in person. Though the individual may need to work fast, he must also learn how to segregate physical speed and to eliminate mental hurry. To use a railroad analogy, living in the block system is one thing a great many of us could learn with profit.

There is a question to be checked: "Do you worry?" Here the examiner must be careful. It is frequently answered in the affirmative but usually the worry is only a minor feature, perhaps about whether or not the money will last out the term. Occasionally the affirmation was furtive and you catch a suspicious circumstance in the way your questions are answered. It is not at all remarkable to uncover here a problem of considerable magnitude. But also, questioning may uncover that vicious fault in any age—the chronic worrier. Perhaps some are born with the attitude; perhaps it is developed from parental examples; I am sure it can be learned and amplified in college life. I have tried to formulate a succinct expression for use to instruct this type. I point out the block system type of life, but above all I emphasize doing a thing to the best of one's ability and then facing the consequences, whatever they may be. It is fear of consequences which seems to me to keep this type in a state of constant mental agitation.

These few examples will suffice to show what seems to me to be a therapeutic field of considerable importance. It borders on the psychiatrist's province but he is as unqualified from the physical-clinical side as an internist is on the technical side of psychiatry. Besides, we have very few psychiatrists with us. The essential therapeutic duty of the internist is, after all, that of a teacher. We have only a dozen or so specific cures. We have to instruct the cardiac patient on how to live best with whatever type of heart trouble he has. We teach the diabetic how to manage his disease. Why is it not as justifiable for us to attempt to teach the youth how to avoid functional disabilities as it is to educate them on how to avoid tuberculosis or venereal disease. Only the program is very much more difficult to put over for the reason that it cannot be learned in one year of effort any more than one can play symphonies after one year of piano lessons. That is why the college course is so admirably suited to this therapeutic attack. The student is devoting four years to education, usually without other major responsibilities. He is above average intelligence, can grasp its significance, and is receptive. He is still in his formative years and the physician can take inventory with him annually, or oftener if desired, giving encouragement and advice. I make a plea merely that we shall be somewhat aggressive in seizing any opportunity given us to add to his educational armament some instruction in the Art of Living and incidentally in stopping at its source one agency of disease.

338 LaSalle Building.

THE STROOPAL FRAUD

For many years a nostrum known as Stroopal has been sold on both sides of the Atlantic as a cure for cancer. The product apparently originated in Germany. For some years it was exploited from London and was exposed by London *Truth* nearly twenty years ago. According to Gehe's Codex, Stroopal is composed of the powdered leaves of *Teucrium Scordium,* otherwise known as water germander or wood garlic. For at least seventeen years, Stroopal has been exploited in a small way from Chicago. Recently, Stroopal seems to have been advertised under the name of the Stroopal Company, 2101 Belmont Ave., Chicago. On August 13, the postal authorities issued a fraud order against the Stroopal Company and notified the Chicago postmaster to return all letters addressed to the Stroopal Company to the original senders. (Jour. A. M. A., October 4, 1930, p. 1037.)

THE HORMONE OF THE ADRENAL CORTEX

The Swingle-Pfiffner cortical hormone "extract" has been tested in cases of Addison's disease at the Mayo Clinic. Hartman, Brownell and Hartman also have been able to prepare an extract of the adrenal cortex that will prolong the lives of adrenalectomized animals indefinitely. They also have revived a patient with Addison's disease having a systolic blood pressure of 50 mm. and a pulse of 120 a minute by the use of their preparation of the hormone, for which they propose the name Cortin. "Cortin" administered by mouth appears to give little or no benefit. It is best administered subcutaneously except in circulatory failure in which absorption is greatly reduced; then intravenous injection is employed. One may soon confidently expect the relief of the dire Addison's disease by the cortical hormone. (Jour. A. M. A., January 24, 1931, p. 273.)

SPINAL ANESTHESIA*

Ralph M. Tovell, M.D.
Rochester, Minnesota

SPINAL anesthesia, or subarachnoid block, was first advocated by Corning in 1885. Although Corning's report was based on a false premise his suggestions led to discovery of the truth. In the course of experimental work on root pain, while he was doing a paravertebral injection with cocaine, he accidentally produced spinal anesthesia. He said that it was not essential to deposit the solution within the dura, but that close proximity to the spinal cord or its coverings was sufficient. He based his conclusion on the supposition that the solution would be carried into the spinal canal by the blood vessels. It is now known that this is an erroneous view. Since then the technic has varied, and this method of anesthesia has had brief periods of popularity. With the discovery of procaine, an added factor of safety was found, but not until the use of ephedrine became general did spinal anesthesia gain real favor. During the stages of transition the physiologic changes due to blocking of the spinal rami have become more evident and a rather precise technic has been developed.

SIGNIFICANT CONSIDERATIONS

There are several considerations of significance in the administration of a spinal anesthetic agent: (1) Choice of patients, (2) preliminary medication, (3) dose, (4) site of injection, (5) amount of spinal fluid to be withdrawn in which the crystals of procaine will be dissolved, and (6) rate of injection. I shall consider these points in the order given.

Choice of patients.—Extreme differences of opinion regarding the safety of spinal anesthesia have been expressed by various authorities. At The Mayo Clinic, the use of spinal anesthesia has been limited to operations below the diaphragm. This method is indicated particularly for patients suffering from emphysema, advanced asthma, chronic bronchitis, and other respiratory conditions, for whom a general anesthetic given by inhalation is contraindicated. Spinal anesthesia may be warranted for patients suffering from intestinal obstruction, extravasation of urine, or senile or diabetic gangrene, in whom the disturbance occasioned by a general anesthetic often diminishes chances for recovery. It is also useful for catheterization of the ureters in a patient in whom a highly sensitive tuberculous or cord bladder is present. Because a few centigrams of the drug have so little effect on the general cellular metabolism, spinal anesthesia is indicated in cases in which the kidneys are not functioning properly. Throughout this country the popular tendency is toward the use of spinal anesthesia for all operations below the diaphragm except in cases in which certain conditions are present, as follows:

1. The procedure is contraindicated in the presence of involvement of the central nervous system by a tumor of the spinal cord, syphilis, epilepsy, intracranial hemorrhage or intraspinal hemorrhage. Cases in which the spinal fluid is turbid, although no other pathologic change is found, should be included in this group.[3]

2. Local pathologic processes at the intended site of injection preclude its use.

3. Patients in whom the blood pressure is extremely high generally experience marked reactions following induction of spinal anesthesia, and in such subjects the dose used must be conservative. Patients with hypotension are often poor operative risks, especially if cyanosis and decompensation are present. Operations above the lower part of the abdomen should not be performed under spinal anesthesia if the systolic blood pressure is below 100 mm. of mercury unless a general anesthetic is absolutely contraindicated.

4. Patients in a state of severe traumatic shock are poor risks for any form of anesthesia. If the shock is not of hemorrhagic origin spinal anesthesia may be used, and is satisfactory when crushing injuries involving the lower extremities are to be treated. In some in-

---

*From the Section on Anesthesia, The Mayo Clinic, Rochester, Minnesota.

stances, due to the breaking of the reflex arc, shock may be partially controlled by the anesthesia. I used the phrase "not of hemorrhagic origin" advisedly because, in a recent article, Burch, Harrison and Blalock reported that hemorrhage in spinal anesthesia is much more likely to cause shock than the same blood loss under ether. Under ether anesthesia, withdrawal of blood equal to 3 or 4 per cent of body weight produced marked decline in cardiac output and blood pressure, but the animals were not in grave danger of immediate death. Under spinal anesthesia death was produced by removing an amount of blood which varied from 0.5 to 1.6 per cent of the body weight. It would seem, therefore, that spinal anesthesia is contraindicated if patients have lost a great deal of blood or if severe loss of blood during the operation is anticipated.

5. Spinal anesthesia should not be used for patients with septicemia or pyemia. The protective barrier between the infected blood and the nerve centers would be eliminated by the puncture.

6. For patients with diminished breathing capacity due to pleural effusions or intrathoracic tumors, combined with lower concentration of hemoglobin, spinal anesthesia is definitely contraindicated.

Preliminary medication.—Several drugs in different combinations and doses have been tried to control the patient's natural dread of an operation, and at the same time to insure his cooperation. The evening previous to operation sodium ethyl methyl butyl barbiturate (nembutal) 100 to 200 mg. (1½ to 3 grains) are given by mouth. One hour before operation it is of benefit to repeat the dose of the barbiturate and to administer morphine sulphate in a dose of 10 to 16 mg. (1/6 to ¼ grain) hypodermically. Instead of the barbiturate and morphine on the morning of operation, 10 mg. (1/6 grain) of morphine sulphate with 0.3 mg. (1/200 grain) of scopolamine hydrobromide may be given one and a half hours before operation and the scopolamine may be repeated one hour later, if necessary. In my experience, the combination of morphine and sodium ethyl methyl butyl barbiturate has been preferred. Unless it is intended that the spinal be combined with a general anesthetic, atropine is probably best omitted, because atropine has a characteristic action of paralyzing the myoneural juncture of all nerves which supply unstriated muscle. The line for vagal innervation is thus broken, and contraction of the intestines is rendered difficult even after the inhibitory sympathetic innervation is paralyzed following subarachnoid block. Therefore when contraction of the intestines is desired administration of atropine defeats one's purpose.

Dose.—As a routine, the history and physical condition are reviewed to discover possible contraindication to spinal block. On arrival in the operating room, the patient's blood pressure, age, weight and height are ascertained. An estimate of the patient's resistance is made and the dose of procaine is decided on, taking these factors into consideration, together with the site and the possible duration of the operation. In my opinion, from 1 to 1.5 mg. (1/64 to 1/40 grain) for each pound (0.55 kg.) of body weight is the best guide in the calculation of the dose of procaine, with 300 mg. (5 grains) as the maximal amount for any operation. The smaller doses should be given to old and debilitated patients, who are affected by hypotension and cardiac disease, recent extreme loss of weight, or decreased respiratory surface and lowered concentration of hemoglobin, with the attendant decrease in the power of the blood to carry oxygen. For operations on the extremities, perineum, or urinary bladder, I have found that a dose of 80 to 120 mg. (1 1/5 to 2 grains) of procaine is ample. For operations on the lower part of the abdomen 120 to 150 mg. (2 to 2 2-5 grains) is required, whereas for operations on the upper part of the abdomen, the gallbladder and the stomach, 150 to 300 mg. (2 2-5 to 5 grains) may be given.

If the blood pressure is normal, a hypodermic injection of 50 mg. (¾ grain) of ephedrine should be given five to ten minutes before introduction of the anesthetic agent. If the blood pressure is 160 mm. of mercury or higher, it may be desirable to delay the injection of ephedrine until the lumbar puncture needle is in place. Thus, if the lumbar puncture cannot be completed, one is guarded against unduly raising the blood pressure. If the systolic pressure is less than 100 mm. of mercury, it is advisable to give 50 mg. (¾ grain) of ephedrine twenty minutes before the spinal anesthetic is introduced; unless there is some response to the ephedrine it is advisable to use only a small dose of procaine. If the systolic blood pressure is much lower than 100 mm. of mercury, it usually is not advisable to give a spinal anesthetic unless the fall of blood pressure is due to the derivative of barbituric acid used in preliminary medication. One should not be unduly alarmed by such a drop in blood pressure when estimating the dose of procaine.

Site of injection.—For operations on the lower part of the abdomen, puncture is made between the third and fourth lumbar vertebræ, and for operations on the upper part of the abdomen, injection is made between the second and third lumbar vertebræ. Recently, at the clinic, we have found that for operation on the gallbladder and stomach injection is better made between the first and second lumbar vertebræ; occasionally injection has been made between the twelfth thoracic and the first lumbar vertebræ with good results.

TABULATION

DOSAGE AND DILUTION OF PROCAINE IN SPINAL ANESTHESIA*

Operation	Site of injection between lumbar vertebræ	Dose of procaine, mg.	Amount of spinal fluid, c.c.
Amputation of leg	3 and 4	100 to 120	3
Prostatectomy	3 and 4	100 to 120	3.5
Herniotomy (inguinal)	3 and 4	120 to 150	3.5
Appendectomy	2 and 3	120 to 150	4
Colostomy	2 and 3	120 to 150	5
Hysterectomy	2 and 3	150 to 200	5
On gallbladder	1 and 2	150 to 200	5
On stomach	1 and 2	200 to 250	6

*Spinal needle, gauge: 20 to 22.
Rate of injection: 0.25 c.c. each second.

Amount of spinal fluid withdrawn.—For operations on the extremities and lower half of the abdomen, for example, for cystostomy, prostatectomy or herniotomy, anesthesia will be sufficiently high if the crystals of procaine are dissolved in 3 c.c. of spinal fluid; for operations on the colon, 4 to 5 c.c. is sufficient. For operations on the gallbladder and its ducts about 5 c.c. of fluid generally proves satisfactory, whereas operations on the stomach require 6 c.c. of spinal fluid. In operations on the pelvis, such as hysterectomy, when packing off is likely to cause a feeling of fullness and distress in breathing, anesthesia must be fairly high (must extend fairly well cephalad) and 5 c.c. of spinal fluid is required. The height of anesthesia varies directly with the dilution; the higher the anesthesia desired, the greater should be the dilution. The dosage of procaine affects directly the duration of anesthesia; the larger the dose, the longer is anesthesia maintained. Directions for various operations are given in the tabulation.

Rate and technic of injection.—The method of induction of spinal anesthesia is as follows: The patient is placed horizontally on his side on a cart or operating room table. The blood pressure is taken, and the back is cleansed with ether. An assistant draws up the patient's knees and brings the head downward to get maximal bowing of the vertebræ without producing discomfort. A wide area over the lumbar and upper part of the sacral region is sterilized with iodin, and a sterile towel is draped across the area, with its vertical edge at the intercristal line, crossing the vertebral column at the level of the spine of the fourth lumbar vertebra. The interspace desired can be counted from this point. In obese patients, when the level of the intercristal line is obscure, the spine of the first lumbar vertebra can be found by the following maneuver and the site of injection determined. A point 7 cm. (or four fingers' breadth) from the median line is determined on each side at the lower border of the twelfth rib. The line joining these points crosses the vertebral column at the level of the spine of the first lumbar vertebra. As a final step, a perineal sheet is used to outline further the sterile field.

When the proper interspace has been determined, a cutaneous wheal is raised with a wheal needle; with a 50 mm. needle, 4 c.c. of 1 per cent solution of procaine, and 50 mg. of ephedrine are infiltrated along the course that the needle used for the puncture is to follow. The spinal needle, gauge 20 or 22, is inserted, and from 3 to 4 c.c. of spinal fluid is allowed to flow into the ampule containing the procaine. The stylet is then inserted to prevent further outflow of spinal fluid. The procaine is dissolved readily by repeated aspiration. The solution is then aspirated into the syringe from the ampule, the stylet is removed, the syringe is connected with the needle which has been inserted in the spinal canal, and the remainder of the estimated amount of fluid required is gently withdrawn. The solution is then injected, without pause, at a rate of 0.25 c.c. each second. As a check on the technic it is advisable immediately after injection is finished to aspirate 0.5 c.c. of spinal fluid. It is always a satisfaction to have spinal fluid aspirate freely and thus to know that the needle is still in the proper position.

The patient is then turned on his back and the head of the table may be lowered slightly until the operation is completed. The full Trendelenburg position may be employed if the surgeon desires. All changes of position should be made slowly and gently to prevent nausea, vomiting and respiratory embarrassment. Anesthesia develops in from four to ten minutes and is maintained for thirty to seventy minutes. For three hours after the operation the patient is kept lying flat on his back and the head is not elevated.

DESIRABLE AND UNDESIRABLE EFFECTS

Ideal spinal anesthesia insures perfect relaxation of the abdominal wall, contraction of the intestines, and consequent ease of exposure. Unfortunately, certain complications may occur both during and after operation. Failure to obtain anesthesia is disconcerting, but is due generally to faulty technic rather than to anatomic anomalies. If the anesthesia is not effective twenty minutes following the injection, a second injection may be made with comparative safety. Anesthesia which develops to within 3 to 7 cm. of the height desired is annoying but it may be supplemented with local infiltration of 0.5 per cent procaine, or nitrous oxide may be given.

During the first twenty minutes, there is usually a fall in the blood pressure of from 15 to 20 mm. A continued drop is of some concern. Three factors are involved.

The first factor is loss of vasomotor control. Normally there is a balance between the vasoconstrictors and the vasodilators.[6] If the vasoconstrictors or sympathetic fibers which arise from the first thoracic to the third lumbar vertebræ are paralyzed, the vasodilators or parasympathetic nerves, particularly the vagus nerves, become overactive and the blood vessels in the abdominal region dilate. The degree of drop in blood pressure is determined, to a large extent, by the height of the anesthesia and the number of sympathetic nerves involved. Fairly high anesthesia may be obtained without any alarming drop in blood pressure if the major portion of the procaine is deposited posterior to the ligamentum denticulatum and therefore more intimately in contact with the sensory than with the motor roots.[4] To accomplish this, and to prevent the solution escaping anteriorly through the denticulate margin of the ligament, injection of the procaine must be slow.

The second factor, slowing of the cardiac rate, depends on loss of balance between the vagus nerves, or inhibitory nerves, and the sympathetic or accelerator nerves. If the sympathetic fibers from the first to the fourth thoracic segments are anesthetized, the vagus nerves are left in control and produce slowing of the heart.

The third factor involved in the fall in blood pressure is paralysis of the thoracic and abdominal muscles. The pumping or aspirating action of the thorax is diminished; the heart receives a smaller amount of blood, and is therefore unable to supply the normal quantity to the brain. Cerebral anemia thus can develop. The Trendelenburg position is the essential treatment to offset this complication. Five minims of epinephrine administered subcutaneously may be given and the dose repeated once or twice. If the drop in blood pressure is late in the operation and is due to surgical shock, intravenous injection of physiologic solution of sodium chloride may be required.

With the fall in blood pressure there may be pallor, nausea, retching, and vomiting. Treatment of the fall in blood pressure ordinarily alleviates the nausea. The nausea often is psychic, depending on the mental impressions of an overactive mind. Sufficient preliminary medication and an entertaining anesthetist may eliminate this complication. The nausea may be reflex, caused by packing off too tightly or by manipulation of viscera of the upper part of the abdomen. The surgeon's coöperation is essential here. The treatment also includes deep breathing through the mouth, or intermittent inhalation of a mixture of 90 per cent oxygen and 10 per cent carbon dioxide. By this method, the pumping action of the thorax is improved, the blood pressure is raised, and the nausea is decreased. In a small percentage of cases, the retching may be so annoying to the surgeon that supplementary anesthesia with nitrous oxide or ethylene will be required.

Following the operation, headache is the most common complication. The patients usually complain of occipital pain appearing twenty-four hours after operation, which is worse when the head and shoulders are raised and is relieved when the head is lowered again. This pain is thought to be due to continued loss of spinal fluid through the lumbar puncture wound in those cases in which the arachnoid clings to the spinal needle as it is withdrawn and the arachnoid is herniated through the dura. This condition is rather intractable to any form of treatment and may linger for several days or weeks, but eventually it clears spontaneously. The incidence of headache is no greater following spinal anesthesia than following lumbar puncture for diagnosis when from 6 to 7 c.c. of spinal fluid has been withdrawn. It has been reported that a retention enema of 180 c.c. (6 ounces) of 50 per cent solution of magnesium sulphate gives relief. Surgical pituitrin, one ampule, or ephedrine, 50 mg. (¾ grain), given hypodermically produces improvement in some cases, but the essential factor in the ultimate result is time.

Meningitis is an ever-present possibility, but with aseptic technic such a complication can be avoided. Regions of numbness in the legs may persist for some time, but this numbness usually disappears without treatment. Ocular palsy, involving the lateral rectus muscles, is rare, but it may develop in the second week following operation. Squint develops and the patient complains of double vision. Fortunately, all such conditions reported have cleared without treatment. These complications are not common, but should always be thought of as possibilities. They have not been of sufficient significance to prevent spinal anesthesia increasing steadily in popularity.

In surgical procedures on the upper part of the abdomen particularly, nausea, and anesthesia of too short duration, are real problems. Variations in dose of procaine, in amount of spinal fluid used as a solvent, and in rate of injection, all have been given a trial. The incidence of nausea is highest in upper abdominal operations, but I still feel that to obtain satisfactory high anesthesia of sufficient duration, the dose of procaine should not be increased beyond the estimated limit of safety.

COMMENT

Properly induced spinal anesthesia, using any of the approved methods, produces complete freedom from pain in the operative field, absolute relaxation of muscles, contraction of the intestines, and relaxation of the anal sphincters which permits the escape of flatus and facilitates operative exposure. The small dose of drug is so placed to obtain the maximum of anesthesia with the least generalized toxicity. The fall in blood pressure occurs early in the operation, when the patient is best able to withstand it. The mucous membranes are not irritated as with ether, and postoperative vomiting is reduced to a minimum. The incidence of postoperative pulmonary complications is reduced. The method may be used for patients requiring emergency surgical procedures in whom slight infection is present in the upper part of the respiratory tract. Fluids can be administered by mouth earlier than following a general anesthetic.

Technically, the method of administration usually is fairly easy, but precision and dexterity must be acquired to obtain uniform results. The equipment necessary is standardized and easily procured.

Spinal anesthesia has its limitations. It is applicable in operations below the diaphragm and preferably below the umbilicus. The patient is awake and may fail to coöperate. Faulty technic in administration is more obvious than with a general anesthesia. With the use of procaine there is a definite limit to the duration of anesthesia and a general anesthetic may be required to complete the operation. The complications mentioned may occur during and following operation.

BIBLIOGRAPHY

1. Burch, J. C., Harrison, T. R., and Blalock, Alfred: A comparison of the effects of hemorrhage under

ether anesthesia, and under spinal anesthesia. Arch. Surg., 21:693-697 (Oct.), 1930.

2. Corning, J. L.: Spinal anesthesia and local medication of the cord. New York Med. Jour., 42:483-485 (Oct. 31), 1885.
3. Evans, C. H.: Spinal Anesthesia. New York, P. B. Hoeber, Inc., 1929, 203 pp.
4. Koster, Harry: Spinal anesthesia, with special reference to its use in surgery of the head, neck and thorax. Am. Jour. Surg., 5:554-570 (Dec.), 1928.
5. Koster, Harry, and Kasman, L. P.: Spinal anesthesia for the head, neck, and thorax; its relation to respiratory paralysis. Surg., Gynec. and Obst., 49:617-630 (Nov.), 1929.
6. Moe, R. J.: The physiology of spinal anesthesia. Minnesota Med., 13:183-185 (Mar.), 1930.

POTASSIUM THIOCYANATE IN HYPERTENSION

Thiocyanates resemble iodides in their therapeutic effect, but they do not affect the thyroid gland. As with iodides, the action of thiocyanates can not be satisfactorily explained. The reduction of blood pressure is dependent on the dose. The small dose of 0.1 Gm. (1½ grains) three times daily frequently fails to produce an appreciable reduction. The large dose, 0.3 Gm. (5 grains) three times a day, reduces blood pressure in a majority of cases but it is so liable to produce untoward results that such patients must be under careful supervision. The Council on Pharmacy and Chemistry has refused admission of potassium thiocyanate to New and Non-official Remedies because it considered the evidence for the drug's therapeutic value inconclusive and published a report giving the limitations of therapy with this drug. (Jour. A. M. A., February 21, 1931, p. 632.)

W. H. Y.

This product has been described by its exploiters, the Bartlett Nu Products Corporation, Azusa, Calif., as a "100 per cent pure, concentrated food beverage." G. M. Bartlett, President, Treasurer and General Manager of the corporation, claims to be the "discoverer" of the formula for W. H. Y., the ingredients of which are said to be extracts of raisins, figs, walnuts, peanuts, barley, wheat and celery. In 1928 a Notice of Judgment was issued against W. H. Y. because of the false and fraudulent claims contained on the trade package. However, Mr. Bartlett has apparently continued to make equally false and fraudulent claims in such advertising as does not go with the trade package. As W. H. Y. was sold through the United States mails, this brought Mr. Bartlett in conflict with the postal authorities, who have declared the exploitation of W. H. Y. fraudulent and debarred it from the mails. (Jour. A. M. A., March 21, 1931, p. 967.)

OBSERVATIONS ON SEROTHERAPY IN SCARLET FEVER*

Alexander Stewart, M.D.
Saint Paul

INCE the introduction of commercial scarlet fever antitoxin five years ago numerous ports on the results of this treatment have en published. Some of these reports have en very favorable as to the lowering of tem- rature, alleviation of symptoms and reduc- n in the percentage of complications and rtality. Cushing,[1] in 1926, reported a mor- ity rate of only 1.1 per cent, and a reduction complications by 25 per cent in those ated by antitoxin over the untreated cases e previous year. In a series of cases re- rted by Platow and Collins,[2] the rash dis- peared, the temperature returned to normal, d the symptoms were alleviated from one d one-half days to two days sooner than in e untreated controls. The Dicks,[3] in a group 100 cases, report nineteen complications in e untreated and four in the treated. Doo- tle[4] had 18 per cent complications in the ated, compared with 23.3 per cent in the ntrols.

Other reports comparing the treated with se untreated with specific sera have not own any appreciable beneficial results from e use of scarlet fever antitoxin. Toomey d Dolch[5] made an analysis of 1,658 scarlet er cases occurring in the Cleveland City spital and found the mortality rate very low the untreated cases.

I have been using antitoxin in scarlet fever tients, both on my service in the contagious spital and in private practice, ever since it s been available, and I thought it might be eresting to analyze the results of its use.

Of the cases occurring before the opening of e new contagious department at the Ancker spital, and in private practice, I have no mplete histories, so I have confined this dy to only those cases that occurred in my vice in the new Contagious Hospital in 28 and 1929.

The first serum used in the treatment of rlet fever was convalescent serum, and was first used by Weisbecker and Von Lyden in 1897 with doubtful results.[6] Later the method was made more effective by the work of Reiss and Jungman in 1912.[7] They collected blood from scarlet fever cases at the end of the third or fourth week, removing 100 to 200 c.c. from the veins of adult patients, and then obtained the serum by centrifuging. The pooled serum of at least three donors was placed in sterile ampules and kept in a cool place and was used for the toxic cases only.

In this country Zingher made use of whole convalescent blood, which he injected intramuscularly.[8]

My experience with convalescent serum has been limited to a few cases and has been confined exclusively to whole blood given intramuscularly. In some of the toxic cases I obtained a reduction in temperature and toxicity, but not nearly the marked improvement that we see following the use of the present scarlet fever serum.

For the last five years we have been using commercial antitoxin. At first the serum was so bulky and unconcentrated that we had difficulty in its administration, and had many severe serum reactions. Since then there has been a gradual refinement of the serum so that now the same units of antitoxin are furnished in one-fifth the quantity of serum, and we have much fewer and much less severe reactions.

Antitoxin has been used in the treatment, prophylaxis and diagnosis of scarlet fever.

ANTITOXIN IN THE TREATMENT OF SCARLET FEVER

During the last two years we have administered antitoxin to thirty-four severe septic or toxic cases of scarlet fever. We have not used antitoxin in the mild cases, as our previous experience in the old Contagious Hospital had shown that we did not obtain results from its use in the mild cases and that the serum sickness which followed often was worse than the disease itself.

Thesis presented before the Minnesota Academy of Medicine, ember 12, 1930.

In all cases in which we used antitoxin in the first three days of the disease the results have been gratifying; some have almost been spectacular, others showed a moderate to a marked improvement in twenty-four hours.

ILLUSTRATIVE CASES

A. Those treated early before the fourth day of the disease:

Case 1.—G. B., aged sixteen years, entered the hospital on the third day of the disease with a temperature of 104 and pulse of 140. A generalized eruption was present over the entire body. The patient was toxic and the throat very congested. On admission 150,000 skin test doses were administered. In twenty-four hours the temperature was 99.2 and the rash almost faded. Uneventful recovery without complications followed.

Case 2.—T. H., aged seven years, entered the hospital on the second day of the disease with a temperature of 105 and pulse of 130. A moderately severe rash was present but the patient was very toxic and delirious. On admission 150,000 skin test doses were administered. In twenty-four hours the rash was fading, the throat much improved and the temperature 101. The patient made an uneventful recovery and left the hospital on the twenty-fourth day.

B. Those receiving antitoxin after the fourth day:

Case 1.—P. N., aged 22 months, entered the hospital on the fifth day of the disease with a temperature of 105.6 and a pulse of 140. The rash was fading but the patient was very toxic with a septic throat. At once 150,000 skin test doses were administered. Examination twenty-four hours afterwards showed not much change in the throat, but the temperature had dropped to 102. A bilateral suppurative adenitis developed which required incision and healed in three weeks.

Case 2.—C. S., aged six years, entered the hospital on the sixth day of the disease with a temperature of 106 and pulse of 140. The patient was delirious and had a septic throat with marked adenitis. Twenty-four hours after the administration of 300,000 skin test doses the temperature was reduced to 100, but the patient remained delirious. Blood culture taken at this time showed a hemolytic streptococcus, and the patient died three days after entering the hospital.

COMMENT

These four cases typical of our series are presented to show the uniformly good results obtained from the administration of scarlet fever antitoxin early in the disease, and the varied and indefinite results if administered after the third day.

In the group treated before the fourth day there were no deaths. Complications that were not present on admission occurred in only 7 per cent of the cases, and these were either otitis media or adenitis.

Serum sickness occurred in 23 per cent of our cases receiving antitoxin.

On account of the universal use of diphtheria toxin-antitoxin, we have made it a routine procedure to first administer 0.5 c.c. of the antitoxin subcutaneously to desensitize the child, and if there is no reaction to follow in two to four hours, with the rest of the dose.

Of the patients who received 0.5 c.c. of antitoxin subcutaneously, only one had anaphylactic shock, a boy who never had had toxin-antitoxin and on whom we had tried the blanch-extinction test to establish our diagnosis.

In our experience we have never been able to demonstrate any relationship between the degree of anaphylactic shock and serum sickness, and the previous administration of toxin-antitoxin. If we found that we were getting more than the normal amount of serum sickness, investigation showed it to be due to some quality in the serum used, generally that it was not properly aged.

ANTITOXIN IN THE PROPHYLAXIS OF SCARLET FEVER

My experience with scarlet fever antitoxin in the attempt to develop a passive immunity in cases exposed to scarlet fever has been confined exclusively to private practice.

As a whole, my experience has not shown antitoxin to be satisfactory. In some cases it has not developed an immediate immunity and the exposed individual has developed scarlet fever; others may have developed a short immunity but contracted the disease within one year. The most objectionable feature was the serum sickness which followed. Some of these reactions were mild, but in many instances the patient suffered more than he would have if he had developed the disease. In two instances the reaction was extremely severe; in one the patient died. This was a girl of four years who was exposed to her sister who had a very mild or suspicious case of scarlet fever. A prophylactic dose of antitoxin was administered by the family physician. On the fifth day after receiving the antitoxin she developed an urticaria with adenopathy and toxemia. This became steadily worse until death occurred on the tenth day. A very exhaustive postmortem examination revealed nothing but a general adenopathy, especially of the pelvis and abdomen.

We believe that no definite evidence has developed from our experience to justify the use of scarlet fever antitoxin to develop a passive immunity; in fact, several biological houses have withdrawn the prophylactic dose from the market.

ANTITOXIN IN THE DIAGNOSIS OF SCARLET FEVER

The Schultz-Charlton reaction or blanching test has been a definite aid in diagnosis of some doubtful cases of scarlet fever.

The reaction is brought about by the intradermal injection of 0.5 c.c. of scarlet fever antitoxin where the rash is well marked, such as on the chest, abdomen or thigh. Twenty-four hours afterwards, if the case is scarlet fever, a blanching of the skin around the site of injection occurs.

Before the advent of antitoxin we used convalescent serum, but the reaction was not always so striking.

This test will not help a great deal in the mild cases, because we must have a distinct rash to bring out the reaction, but it has been a definite aid in differentiating erythemas and drug rashes from scarlet fever.

SUMMARY AND CONCLUSION

I appreciate the fact that thirty-four cases is a very small group from which to draw any definite conclusions as to the value of scarlet fever antitoxin as a therapeutic agent, and that many cases have to be treated before we know its exact value; also that during these two years the city mortality rate was very low. Of 1,188 cases occurring in the city during this period there were only nine deaths, a mortality rate of 0.76 per cent.

We have administered antitoxin to a great many more patients, especially when antitoxin was first introduced. Then it was given almost routinely in hospital and private cases. We have no exact records but the results were similar to this group of which I have made a more critical study.

To offset the mildness of the present type of scarlet fever, we gave antitoxin to only the septic or toxic cases. We have a working rule in the hospital that if the temperature is not over 102.5, or if the patient is not septic or toxic, we will not administer antitoxin.

1. Thirty-four septic or toxic cases of scarlet fever treated with scarlet fever antitoxin in the Contagious Department of the Ancker Hospital, St. Paul, during the last two years were observed. Of these, four representative cases are reported.

2. All patients receiving antitoxin before the fourth day recovered. Only 7.5 per cent developed complications, and these were adenitis and otitis media. Twenty-three per cent of all patients receiving antitoxin had a serum sickness, a few reactions being moderately severe, but the majority mild.

3. We believe that scarlet fever antitoxin is a specific and prompt cure for uncomplicated scarlet fever if given early, and should be used promptly in all cases that are septic or toxic.

4. From our experience with scarlet fever antitoxin as a prophylactic measure we do not feel justified in recommending it as a method of developing a passive immunity; in fact we advise against its use, because: (1) some patients do not become immunized; (2) others lose their immunity in a short time; (3) the reactions in many instances are very severe, one in our experience having proved fatal.

5. In the Schultz-Charlton phenomenon or blanching test we have a distinct aid in differentiating scarlet fever from erythemas and drug rashes. The test is not of much help in the diagnosis of mild cases in which there is only a slight rash.

BIBLIOGRAPHY

1. Cushing, H. B.: Results of the use of scarlet fever antitoxin. Canadian Med. Assn. Jour. (Aug.), 1926.
2. Platow, E. S., and Collins, L.: Clinical study on prevention and serum treatment of scarlet fever. Arch. Pediat. (Nov.), 1926.
3. Dick, George T., and Dick, Gladys H.: Therapeutic results with concentrated scarlet fever antitoxin. Jour. Am. Med. Assn. (Nov. 28), 1925.
4. Doolittle, S. G.: Treatment of scarlet fever cases. Northwest Med. (Jan.), 1927.
5. Toomey, J. A., and Dolch, S. G.: Studies in scarlet fever. III.—An analysis of scarlet fever cases untreated by specific serums or antitoxins. Am. Jour. Dis. Child. (March), 1927.
6. Deutsches Arch. f. klin. Med., 39:832, 1902.
7. Deutsches Arch. f. klin. Med., 106:70, 1912.
8. Arch. of Pediat., 32:291, 1915.

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS*

Oswald S. Wyatt, M.D., F.A.C.S.
Instructor in Surgery, University of Minnesota
Minneapolis

THE clinical entity of congenital hypertrophic pyloric stenosis has been recognized for a good many years. As early as 1777 Armstrong described the necropsy findings of a case.

H. Beardsley reported the first case in this country in 1841. He described the clinical and necropsy findings in the fifth year of life, symptoms being present in the case from infancy. He noted that "the pylorus was invested with a hard compact substance, or schirrosity, which so completely obstructed the passage into the duodenum, as to admit with the greatest difficulty the finest fluid. The stomach was unusually large and about the thickness of a hog's bladder."

Siemon and Dawosky reported the first case in Germany in 1842 and for the first time called attention to the projectile type of vomiting. Both of these men attributed the stenosis to hypertrophy of the submucosa.

Landerer in 1879 first used the term "congenital pyloric stenosis."

Hirschsprung in 1887 and 1888 presented the clinical findings and created modern interest in this disease of infants. He considered the condition as a primary developmental hyperplasia.

Finkelstein first called attention to the palpable tumor in 1896. Cordua in 1893 reports that the early operations performed were jejunostomy. Later Stiles reports resection of the pylorus and Loreta performed pyloric divulsion through a gastrostomy. None of these operations were generally successful.

Dr. Edmund Cautley in the British Medical Journal for 1898 reported a death in the fifteenth week from vomiting and marasmus. Another infant died in the eighth week. He noted the characteristic symptoms about as described at present. All his reports were of postmortem findings. He noted that symptoms usually began within the first month. In two cases the tumor had been noted during life. Regarding etiology, he suggested that it might result from a redundancy of fetal growth, due to the anxiety of nature to provide an efficient pyloric sphincter. Rolleston, in discussing this paper, said that pylorectomy was the form of surgical treatment most likely to be successful.

In the same year Willey Meyer and Stern reported a case in which a gastro-enterostomy was done. Also in 1898 Lobker reported the first successful enterostomy. This was the operation of choice for nearly fifteen years.

Heinecke-Mikulicz devolved the first pyloroplasty. In 1907 Fredet performed the first successful submucous pyloroplasty, suturing a longitudinal incision transversely. In 1910 Weber performed the same procedure as Fredet, calling it partial pyloroplasty.

As late as 1912 Rammstedt advised omission of the transverse sutures of Fredet and advised leaving the pyloric wound gaping. This operation of Rammstedt's is today accepted as routine surgical treatment for these cases.

ANATOMY

The normal pylorus in infants is a cylinder about 1.5 cm long. The lumen is usually obliterated by folds of mucous membrane. The pylorus has a powerful sphincter containing both circular and longitudinal muscle fibers which are greater here than in any other portion of the stomach. Longitudinal muscle fibers which radiate from the esophagus and pass over the stomach end before they reach the pylorus. A new set of longitudinal fibers arise on the walls of the stomach which form the longitudinal coat for the pylorus. Very few of these fibers pass over into the muscular coat of the duodenum. The deeper longitudinal fibers penetrate the pyloric sphincteric ring. This apparatus is antagonistic to the pyloric sphincteric ring. Thus the ring has a dilator and a constrictor muscle.

ETIOLOGY

In at least 50 per cent of cases the firstborn child is the one affected. Boys suffer from this affection more than girls in the proportion of 8 to 1. Just what is the explanation of the muslar hypertrophy which is responsible for the structive symptoms is a problem. Hirschrung and Cautley advanced the theory that ere is a primary congenital muscular hyperophy in the affected region, and that this is asciated with a secondary increased functional tivity, the combination resulting in a pyloric struction.

---

*Thesis presented before the Minneapolis Surgical Society October 2, 1930.

Thomson maintained that a functional overtivity of the muscle is the primary factor, that e functional error depends upon a want of codination of the normal stimuli, and that the reated forceful contractions of the muscle result a secondary hypertrophy.

Holt believes that hypertrophy precedes spasm d continues long after the spasm has ceased. ost observers believe there is a certain amount spasm also present. The relation of hyperophy and spasm to symptoms remains in chaos.

Still believes that there is a congenital lack of bility in the harmony of gastric and pyloric laxation and contraction. Another theory asmes that hypertrophy is primary and spasm condary.

Downes and Bolling believe that there is a imary developmental hyperplasia of the circumuscle layer of the pyloric canal. They are so of the opinion that hypertrophy always predes spasm, but that not until spasm has been ded do symptoms appear. Likewise, they state at the severity of symptoms is dependent upon e degree of spasm and the amount of obstrucn caused by the hypertrophy. They believe ere is apparently no relationship between the verity of the clinical symptoms and the size of e tumor.

Dent, Greenbaum and MacHaffie consider the perplasia congenital because the condition has en noted in a seven months fetus, and in seval instances a few hours after birth. Associed with the hyperplasia is a secondary ineased functional activity, the combination relting in pyloric obstruction.

Whichever view is accepted we must apprete that the obstruction results from the ineased bulk of the muscular fibers and the powful contractions of the hypertrophied muscle.

PATHOLOGY

The muscular hypertrophy extends proximalfrom the level of the pyloric veins along the mach wall to the region of the incisura angularis. The hypertrophy stops almost abruptly at the first portion of the duodenum. The hypertrophied pylorus has the appearance and feel of a solid tube about 3 cm. in length and varies from 1 to 2 cm. in thickness. In shape it resembles an olive. The consistency is almost that of cartilage and the color is whitish-pink. On section the thickening is found to be due to a hyperplasia of the circular muscle layer. The submucosa is usually edematous; the other layers are unchanged. Fraser believes that the circular pyloric sphincter is not affected by the hypertrophy. The tumor is smooth, glistening and usually freely movable. The amount of hypertrophy and dilatation of the stomach depends upon the stage of the disease and the degree of obstruction.

SYMPTOMS

A previously healthy, breast-fed infant begins to vomit, apparently for no reason, and usually between the second and fourth week. The vomiting persists, becomes forceful and finally projectile. The vomiting usually occurs right after the feeding, but may occur while the infant is at the breast. The amount of vomitus usually represents the entire stomach content. Vomiting may not be present after every feeding but when it does occur the vomitus, if measured, will be found to be greater in amount than the last feeding. The vomiting is unaccompanied by fever and the appetite is unimpaired. Such characteristic vomiting is rare after the sixth week, but I have operated once where the vomiting began in the eighth week and have seen one performed when it began in the sixteenth week.

If the child presents emaciation and dehydration of a moderate degree, gastric peristalsis is visible and in about 50 per cent of instances a tumor is palpable. Frequently the gastric outline is visible before the waves start; then one, two or even three waves may be seen passing across the stomach. The waves simulate a golf ball passing under the surface of the abdomen.

Various authors place different valuations upon the palpation of the tumor as a diagnostic sign. Surely palpation of the tumor is a valuable diagnostic sign, but I do not believe that one should wait for a palpable tumor before making a diagnosis and deciding upon operation. Bolling believes that it is the most important sign and, if sought in the proper manner, can be felt every time. If the abdomen is palpated while the child is feeding, the pylorus can be felt usually just above the umbilicus, sometimes up under the liver and occasionally just below the ensiform process. Bolling, in 611 cases, felt it in all but two cases and only in three cases was the pre-operative diagnosis incorrect. Personally, I have not been able to palpate the tumor in over 50 per cent of cases. If an operation is undertaken and no tumor found, certainly no operative procedure should be carried out on the pylorus.

The secondary symptoms, such as constipation, scanty urine and weight-loss, are merely the result of vomiting. The weight chart is all-important. One infant we observed in the hospital for twelve days, during which time it just held its weight; then it began to lose and an operation was done. The rate of weight-loss is an excellent guide as to the severity of the obstruction. In severe cases the loss will be 50 to 100 gm. per day and if allowed to go from two to six weeks death will usually occur. If the disease has lasted for more than four months the infant will usually recover.

DIAGNOSIS

With the above clinical picture in mind, the diagnosis should be relatively easy. Projectile vomiting, visible gastric peristalsis and palpable pyloric tumor are found in no other condition in infants. The use of the X-ray is not necessary for a diagnosis and yet occasionally in doubtful cases it will be of value. In one case observed there was such a severe cardiospasm with dilated esophagus that pyloric stenosis was simulated, and only by the aid of the X-ray were we able to make a differential diagnosis. When vomiting occurs from birth the X-ray is of aid in ruling out congenital malformations of the duodenum and esophagus.

TREATMENT

The medical management in case of pyloric stenosis consists of one or more of the following: atropine, breast-feeding, gastric lavage and thick cereal feeding. I feel that except in desperate cases a fair trial on medical management should be given. By this I mean an infant in fairly good condition under a pediatrist's care and holding its weight should be given a week or ten days' trial. I do not believe that such treatment should be persisted in if the baby is losing ground or if we have to take it away from the breast. No medical treatment is a substitute for breast milk.

Holt states that non-operative cases show no symptoms after the first year; yet there is the possibility that the condition predisposes to pyloric obstruction in later life.

Strauss maintains that if 80 per cent of the meal has passed through the pylorus in four hours the child does not need an operation. In ten years he has never operated upon a three to four day old infant because in every case, if these infants were kept on the breast for ten days, the symptoms disappeared. These he maintains are cases of pylorospasm and not true hypertrophy. I doubt whether we are justified, in order to avoid an operation, in permitting these infants to lose so much weight at such a critical period in their development that it takes six months to get them back to normal.

PROGNOSIS

The prognosis depends entirely upon the factors present at the time of operation, the preoperative preparation, the post-operative care and the experience of the individual surgeon.

Gladbloom and Spence, studying the records of 163 cases of Bolling, Downes, Holt and Kerley, concluded that: "When symptoms have lasted less than four weeks, the mortality is only one-third as great as when they have lasted four weeks or longer.

"The mortality in artificially fed babies is more than three times that for breast-fed babies.

"In infants weighing 7 pounds or less the mortality was three and a half times as great as in those who weighed more than 7 pounds.

"The mortality increases in direct proportion to the amount of weight lost previous to operation.

"The mortality for breast-fed infants who vomited less than four weeks and who had lost less than 20 per cent of their best weight is almost nil."

Bolling and Downes say this should be less than 3 per cent. In 611 cases they had a mortality of less than 4 per cent and have had a consecutive run of fifty cases without a death.

Babies in fairly good condition after operation are usually out of the hospital in ten to fourteen days.

PREPARATION FOR OPERATION

The proper pre-operative care of these infants s extremely essential for the success of this operation and should always be cerried out in conjunction with a pediatrist. There is no emerency about this operation and infants in poor condition should be given two to three days of pre-operative preparation. Dehydration should be taken care of by enteroclysis and hypodermoclysis of normal saline. Remember that interoclysis is not tolerated well by infants. Intravenous administrations of glucose solution (3 to 5 per cent) should be given in suitable cases. The day preceding operation as much as 10 to 15 ounces may be given in divided doses. Matill and his co-workers demonstrated that the glucose tolerance of these atrophic infants is considerably raised. They found that "the glucose tolerance of the approximately normal infant, as determined by the Woodyatt method, is very likely identical with that of the normal adult, which is 0.8 to 0.9 gm. per kilogram per hour.

"The tolerance of atrophic infants for glucose is considerably greater, varying from 1.4 to 1.8 gm. per kilogram per hour." The body heat should be strictly maintained and transfusions resorted to if deemed necessary, giving 50 to 75 c.c. only at one time.

Before beginning the operation, the infant should be wrapped in cotton batting, the stomach should be evacuated by means of a catheter and the operating table should be warm. Some prefer operating under ether anesthesia; others under local. I feel that when the baby is in good condition general anesthesia is the choice, but when the risk is poor local anesthesia is advisable.

OPERATION

The operation devised by Rammstedt is the one of preference because it is simple, quick and gives excellent results. An upper right rectus incision is made about 3 inches long, which, upon opening the peritoneal cavity, will usually lie over the lower border of the right lobe of the liver. The stomach, which usually presents, is followed along to the plorus, which is delivered through the wound. The hypertrophied pylorus is held between the thumb and forefinger of the left hand. Beginning at the duodenal end of the tumor an incision is made through the bloodless area on the anterior surface. This incision must extend through the peritoneum and superficial muscle fibers across the entire pylorus and slightly up on the stomach wall. Then with a forceps the wound is spread and the muscle fibers torn, first at the stomach end, working down to the duodenal end. The spreading process is continued until the mucosa throughout the entire length of the wound bulges flush with the peritoneum. If the tearing process is maintained at the duodenal end of the wound until the tear begins to circle the duodenum then you are absolutely certain that all the fibers have been torn and none have been overlooked. The transition from hypertrophied pyloric muscle to stomach muscle is gradual and there is little danger of tearing the mucosa at this point. On the other hand, the transition at the duodenal end is abrupt and the greatest caution must be exercised or a perforation of the mucosa will result.

If any bleeding is present it can usually be controlled with hot packs; if not, a fine silk ligature or muscle transplant can be used. It is unnecessary to attempt to cover the wound with omentum. The pylorus is dropped back into the abdominal cavity and the abdominal wall is closed in layers without drainage. Several silkworm sutures are used to prevent post-operative evisceration.

Mixter states that the conservation of body heat and the avoidance of rough handling must be impressed upon the entire hospital staff. Also that speed, gentleness and hemostasis are the essentials for a successful operation.

COMPLICATIONS

Accidental opening of the lumen of the pyloric canal is no doubt the most severe complication of this operation. The mucosa may be opened by cutting, but occasionally it is torn open. I have been fortunate enough never to have cut it, but I have torn it open at the duodenal end of the wound. It is well to remember that the duodenal end presents the abrupt change from hypertrophied muscle to normal muscle and this is the point where the accident is most likely to occur. If this accident should occur, the opening should be sutured with fine silk. Sometimes a small perforation may be overlooked and close scrutiny is necessary. An overlooked perforation means peritonitis and usually death.

Hemorrhage is rare, but with the usual surgical caution regarding hemostasis it should give no trouble.

Post-operative hernia should not occur if the abdominal wall is closed carefully in layers and several silkworm stay sutures used. Contamination of the dressing should be prevented to avoid wound infection.

POST-OPERATIVE CARE

To my mind, the post-operative management in these cases is by far the most important part of the entire procedure and should be done in strict coöperation with a pediatrist.

The head of the bed should be lowered for several hours and body temperature maintained with care. A teaspoonful of castor oil given after twenty-four hours relieves gas and mucus and makes the baby more comfortable. Vomiting during the first twenty-four hours is relieved best by posture and the stomach tube. Hypodermoclysis should be given freely during the first twenty-four hours. Chloral hydrate is excellent to keep the infant quiet during the first twenty-four hours. Water may be given by mouth two to three hours after operation, and diluted breast milk after three to four hours. If the condition of the child permits, it may be returned to the breast in three to four days.

If small frequent feedings are given, the baby as a rule will have no more vomiting. The feeding should be increased about 10 c.c. every day until the required amount is reached. If larger feedings are started, usually the baby will vomit about four times the first day, three the second and so on until the fifth or sixth day, when vomiting ceases. The usual hospital stay is about ten to sixteen days.

RESULTS

Regarding the results of the Rammstedt operation, I am qualified to speak only from a clinical point of view. All of the infants upon whom I have operated have made uneventful recoveries.

Pathological studies of this condition have been made by Martha Wollstein of the New York Babies Hospital, who reports as follows:

"Healing is brought about by the cells of the serosa and submucosa, but the unstriped muscle cells take no part in the process.

"The wound in the pylorus is healed in nine days. The pylorus has become relaxed within two weeks. The stomach has returned to its normal size within a month, and the gap betwee the cut ends of the muscle coats has practicall disappeared in six weeks. In two years, only line of connective tissue fibers separates thes two muscle ends and the stomach is quite normal

"In contrast to the operation of gastro enterostomy, which leaves the pylorus unchanged, the Rammstedt operation cures th pyloric lesion."

Bolling and Downes have followed some o their cases fourteen years and none of them hav shown any evidence of pyloric obstruction or an symptoms referable to the operation. They conclude that careful analysis of operative result proves that there is no interference with norma physiological development.

BIBLIOGRAPHY

1. Beardsley, Hezekiah: Case of a scirrhus in the pylorus of an infant. In: Cases and observations by the Med. Cos. of New Haven County. . . . New Haven, Meigs, 1788, p. 81. Reprinted with title, Congenital hypertrophic stenosis of the pylorus. Arch. Pediat., 30:355, 1903. Comment by W. Osler.
2. Bolling, R. W.: Congenital hypertropic pyloric stenosis. Jour. Am. Med. Assn., 85:20, 1925.
3. Bolling, R. W.: Complete congenital obstruction of the duodenum. Ann. Surg., 83:543, 1926.
4. Cautley, E.: Congenital hypertrophic stenosis of the pylorus. Proc. Roy. Med. and Chir. Soc. Lond., 11:12, 1898: also Brit. Med. Jour., 2:1490 1898.
5. Cunningham: Anatomy.
6. Dent, C.: On congenital hypertrophic stenosis of the pylorus. Brit. Jour. Sick Child., 1:16, 1904.
7. Dorning, J.: Congenital hypertrophic stenosis of the pylorus in an infant, with report of a case. Tr. Am. Pediat. Soc., 16:19, 1904; also Arch. Pediat., 21:681, 1904.
8. Downes, W. A.: Congenital hypertrophic pyloric stenosis. Jour. Am. Med. Assn., 75:228, 1920.
9. Fraser: Surgery of Childhood.
10. Goldbloom, A., and Spence, R. C.: Prognosis in operated cases of hypertrophic stenosis of the pylorus. Am. Jour. Dis. Child., 19:263, 1920.
11. Greenebaum, J. V., and Steinharter, E. C.: Congenital hypertrophic stenosis of the pylorus. Operation 57 hours after birth. Med. Bull. Univ. of Cincinnati, 3:45, 1923.
12. Haas, S. V.: Congenital pyloric stenosis and its treatment by atropin. Jour. Am. Med. Assn., 79:1314, 1922.
13. Holt, L. E.: Hypertrophic stenosis in infants. Jour. Am. Med. Assn., 68:1517, 1917.
14. Lewis, D., and Grulee, C. G.: The pylorus after gastro-enterostomy for congenital pyloric stenosis. Jour. Am. Med. Assn., 64:410, 1915.

15. Meltzer, S. J.: Med. Rec., 54:253, 1898.
16. Moynihan: Abdominal operations.
17. Morgan, E. A.: The post-operative management of pyloric stenosis. Am. Jour. Dis. Child., 11:245, 1916.
18. Nicoll, J. H.: Congenital hypertrophic stenosis of pylorus. Brit. Med. Jour., 2:571, 1900.
19. Richter, Harry M.: Abt's Pediatrics, 3:451.
20. Sauer, L. W.: Hypertropic pyloric stenosis. Arch. Pediat., 41:145, 1924.
21. Sauer, L. W.: Pyloric hypertrophy in hypertrophic pyloric stenosis. Am. Jour. Dis. Child., 27:608, 1924.
22. Shaw and Elting: Arch. Ped., 1904, p. 893.
23. Stiles, H. J.: Pyloric stenosis in infants. Brit. Med. Jour., 2:943, 1906.
24. Still, H. F.: Congenital hypertrophy of pylorus. Brit. Med. Jour., 50:579, 1923.
25. Strauss, A. A.: New methods of pyloroplasty for congenital pyloric stenosis. Jour. Am. Med. Assn., 65:1533, 1915.
26. Strauss, A. A.: Clinical observations of congenital pyloric stenosis. Jour. Am. Med. Assn., 71:807, 1918.
27. Wollstein, Martha: Healing of hypertrophic pyloric stenosis after the Fredet-Rammstedt operation. Am. Jour. Dis. Child., 23:511, 1922.

THE CONTROL OF NARCOTIC ADDICTION

Narcotic addiction is again the focus of an extraordinary amount of attention. The results of investigations concerning the subject are being made public. The taking of narcotics is usually an attempt on the part of some one with little will power to achieve a state of euphoria or artificial happiness. The addict finds withdrawal accompanied by exceedingly unpleasant symptoms and tends to succumb again. Apparently it is possible for an experienced physician to carry an addict through the withdrawal period with relatively little distress. The importance of narcotic preparations should not be under-estimated. Nevertheless there exist in medicine innumerable occasions when one or more of the relatively non-habit-forming sedatives, narcotics, hypnotics and analgesics may be employed to substitute for an opium derivative. A series of articles is to be published in an effort to indicate the relatively few instances demanding the administration of opium or cocaine derivatives and the many available substitutes. It is estimated that under twenty-five per cent of narcotic addiction results from prescriptions by physicians in cases in which such prescribing may not have been absolutely necessary. The physician must try to limit his prescribing of narcotics absolutely to those situations where they are indispensable. The medical use of narcotics in the United States appears to surpass that of any other nation. Efforts are being made to limit the prescribing of narcotics to those instances where their use is indispensable. (Jour. A. M. A., March 14, 1931, p. 862.)

CASE REPORTS

HYPERTHYROIDISM COMPLICATING DIABETES MELLITUS*

R. C. Webb, M.D., F.A.C.S.
Assistant Professor of Surgery, University of Minnesota
Minneapolis

Hyperthyroidism is a disease which fascinates physicians and surgeons extremely. The diagnosis has become very well understood and the treatment though empiric is relatively standardized. The etiology, however, is still obscure. Diabetes mellitus has become more interesting since Banting gave us insulin and both patient and physician find satisfaction in its control. In hyperthyroidism the disturbance in metabolism is that of an increase where the flame of life is excessively fanned. In diabetes mellitus metabolism is impaired due to lack of secretion of another important gland. When these two diseases coexist we find an extremely fascinating situation which is illustrated in the following case report.

Mrs. C. S. was admitted to the Asbury Hospital on July 26, 1928, under the care of Dr. T. A. Peppard. She was thirty years of age, weighed seventy-eight pounds and was five feet, one and one-fourth inches tall. Her occupation was housewife.

She complained of weakness, palpitation, dyspnea on exertion, a good appetite with loss of weight and frequency of urination.

In March, 1927, she had had a cesarean section performed. There had been two previous pregnancies in which the baby had died shortly following birth. She had not felt well during the past fifteen months. Her present complaints began three months before admission following an attack of influenza. Her heart began to beat fast. She became short of breath on exertion and she had been getting progressively weaker and had lost eighteen pounds in weight. Her appetite was very good but she did not get enough to satisfy her. She drank large amounts of water. Her past history was unimportant and her family history was entirely negative.

On physical examination she was found to be a poorly nourished individual with enlarged tonsils, a normal sized but palpable thyroid and a slightly enlarged heart and a lower midline abdominal scar. Her blood pressure was normal and the pulse rate was from 100 to 110 on admission. She was found to be excreting 11 grams of sugar in twenty-four hours when on a diet consisting of 35 grams of carbohydrates, 35 grams of protein and 120 grams of fat. Her blood sugar was .176 and the carbon-dioxide combining power was 58 volumes per cent. The basal metabolic rate was found to be plus 63.

The glycosuria was easily controlled and she became sugar-free after three days of hospital treatment and the blood sugar was normal on the seventh hospital day. She was given Lugol's solution and her diet was increased. On August 8, 1928, the basal metabolism rate had fallen to plus 37. The diet was increased until she started to show sugar, when it was reduced and then increased again and she remained sugar-free with a maximum intake of food. During a period of seven days she was given from 10 to 27 units of insulin daily but otherwise her diabetic condition was controlled by dietetic measures.

On September 7, six weeks after admission and after having been treated with Lugol's solution, she was referred to the writer for operation and a partial thyroidectomy operation was performed. The amount of gland tissue left was estimated as being about the equivalent of one-fourth of a normal lobe. The pathological report showed a lymphocytic infiltration in a few areas, indicating previous activity, but otherwise showed the condition found in hyperthyroidism brought back to normal by treatment with Lugol's solution. Following the operation Dr. Peppard found it necessary to use as much as 50 units of insulin and five days after operation she was constantly sugar-free. Her weight was the same as on admission and she was taking a diet of 48 grams of protein, 98 grams of carbohydrate and 55 grams of fat with a caloric value of 2,000. The basal metabolism on September 24, 1928, was found to be plus 31. A year later, however, on September 10, 1929, the basal metabolic rate was plus 17.

She was discharged from the hospital on September 24, 1928, and at home kept constantly sugar-free, maintaining her weight, and did not need to take insulin.

On July 15, 1929, she developed some furuncles and a rightsided abdominal pain which was diagnosed as appendicitis. On August 7, 1929, she started to vomit, became dizzy, confused and stuporous and was brought into the hospital on August 8, 1929, under the care of Dr. Peppard, suffering from diabetic coma. She was given active treatment and after three days became sugar-free. She was found to be suffering from an acute pyelitis of the right kidney. The diabetes was again controlled and she left the hospital on September 11, 1929, in good condition but requiring insulin in small amounts. She had been getting along very well for one year following thyroidectomy, controlling her diabetes by diet alone until she developed an acute infection which brought about a diabetic coma. After control of the diabetes, her basal metabolism was found to be plus 17 and she was found to require a small amount of insulin.

Subsequent report.

On January 4, 1931, the patient wrote a letter saying hat she had gained thirty-seven pounds and now weighs one hundred fifteen pounds and is actually fat. She has no nervousness or tremor and as far as she knows has no goiter trouble. She does her own housework. She is still taking insulin and requires seven units three times a day in order to remain sugar-free.

---

*Presented before the Minneapolis Surgical Society January 6, 1931.

DISCUSSION

Carnot and Rathery writing in 1912 on Thyroid Hyperplasia in Diabetes reported four cases all with autopsy reports.

Sainton and Gastaud discussed this subject in 1913. They credited Dumontpallier with the first published case in 1847. At that time sixty cases had been reported in the literature where severe diabetes complicated hyperthyroidism. The prognosis was considered grave. Tuberculosis often appeared as a later complication.

Parhon and Nitzulesco in 1926 reported a patient who had an enlarged thyroid without other symptoms. A physician prescribed treatment and the thyroid diminished in size but the patient developed weakness and hunger and thirst and was found to have diabetes mellitus with exophthalmus. The patient was not given surgical treatment and was unable to buy insulin and death ensued in a short time. These authors believed that the treatment for the goiter aggravated the diabetes. It is probable that this goiter was non-toxic and would have had no influence on the diabetes had it been left alone.

In a study of thirty-eight cases of frank diabetes complicated by hyperthyroidism, Wilder in 1926 found that an inconspicous diabetes may be fanned into flame by hyperthyroidism and the insulin requirement is increased. The intensity of the diabetes is reduced by Lugol's solution, paralleling the basal metabolic rate. Thyroidectomy was almost always followed by a gain in tolerance in the diabetes and there were no deaths in the series. In adenomatous goiter with hyperthyroidism, iodine was found to have little or no influence on the course of the diabetes.

Orator in 1927 reported a case of hyperthyroidism and diabetes where insulin therapy had no effect on the diabetes but after thyroidectomy the sugar content of the urine decreased steadily until the patient developed a tolerance of fifty grams of dextrose.

Coller and Huggins in 1927 reported twelve cases from the University of Michigan Hospital treated by operation with one death. Eleven of the patients had adenomatous goiters. In one case following operation the patient developed respiratory difficulties and an emergency tracheotomy was performed. The respiratory difficulties were not relieved, however, until glucose and insulin were given.

SUMMARY

Thyroidectomy will produce a "cure" of the hyperthyroidism when complicated by diabetes mellitus and renders the diabetes easier to handle and at times results in great improvement in carbohydrate tolerance.

Glycosuria frequently occurs in hyperthyroidism and may indicate the presence of a true diabetes. When true diabetes exists the cooperation of surgeon and internist is positively required. Coma may result as a post-operative complication of thyroidectomy when diabetes is present and may be mistaken for tracheal obstruction.

BIBLIOGRAPHY

1. Carnot, P., et Rathery, F.: Hyperplasia thyroidienne dans le diabeta. Bull. et mem. Soc. med. d. hop. de Par., 34:400, (Oct. 25) 1912.
2. Coller, Frederick A., and C. B. Huggins: Effect of hyperthyroidism upon diabetes mellitus. Ann. Surg., 86:877, (Dec.) 1927.
3. Orator, Viktor: Case of exophthalmic goiter and diabetes. Deutsch. Ztschr. f. Chir., 201:402, (April) 1927.
4. Parhon, C. J., and Nitzulesco, J.: Fatal diabetes in a patient with goiter treated by small doses of iodide and thyroid body. Rev. franc. d'endocrinol., Par., 4:189, (June) 1926.
5. Wilder, Russell M.: Hyperthyroidism, myxedema and diabetes. Arch. Int. Med., 38:736, (Dec. 15) 1926.

PACHYMENINGITIS HEMORRHAGICA INTERNA

REPORT OF CASE WITH RECOVERY

Robert Rosenthal, M.D.
Saint Paul

Pachymeningitis hemorrhagica interna in infancy is a rather rare disease, and has a high mortality (60 per cent). It seems therefore justifiable to report a case which presented several interesting features and ended with recovery.

History.—The patient, a boy five and a half months old, was admitted to the hospital December 31, 1930.

The mother was in the hospital with tuberculosis, but the patient apparently was not exposed, as he was separated from the mother shortly after birth. The family history is negative otherwise.

The patient was born prematurely (7 months), weighing 5 pounds and 2 ounces. After an initial loss of almost 1 pound he began to gain in weight and was getting along quite nicely. A Mantoux test at twenty-one days of age was negative, as were also a Pirquet test and a second Mantoux four days later. About the middle of December his skin began to show a yellow tinge; this gradually became worse. The stools always had a normal color. At the same time the child began to perspire profusely about the head and slept poorly. The child was taken to a hospital in Minneapolis and stayed there for two weeks. The hemoglobin was found to be 22 per cent on admission and after an intraperitoneal blood transfusion it went up to 30 per cent.

The child never attempted to sit up and the father thought that such attempts caused pain. He also thought that the child's head had been large since birth, although the attending doctor called it normal at the time of delivery and no abnormality was observed on examination at the age of three weeks.

Feedings: Expressed breast milk was fed for the first five days. Since then the child has been artificially fed. Previous to admission he received a formula containing 1,000 c.c. of milk, 250 c.c. water, five tbsp. dextri-maltose. Cereal was fed three times a day. Viosterol MX in orange juice also was given three times a day.

Physical examination.—The patient was a poorly

TABLE I

Date	Spinal Puncture	Cranial Subdural Puncture
1/2	30 c.c. Clear. Pressure increased. Occasional Lympho. Glob. ft. tr. R. B. C. present (traumatic). Sugar 0.11 per cent. Wassermann neg. Colloidal gold, 0011110000.	
1/5	3–5 c.c. Clear. Normal pressure.	
1/8		Dark brown, about ¾ blood and ¼ spinal fluid. 10 or 11 c.c. High pressure. Fluid browner than normal blood and does not become clearer on standing. Full of R.B.C., many normoblasts.
1/10		Pressure high. Still very bloody. Perhaps a little browner. About 20 c.c. removed.
1/19		About 25 c.c. Dark brownish.
1/23	5 c.c. Clear. Glob. 0. Cell count, 0. Sugar 0.09.	Blood degenerating. There are still nucleated R.B.C. No evidence of blood pigment.
1/28		Fluid still quite brown. Contains much less blood.
2/2		The fluid is slightly less brown. Crenated R.B.C.; R.B.C. breaking down. No evidence of blood pigment. The nucleated R.B.C. are more pycnotic. The W.B.C. are large monocytes and lymphocytes. A culture of fluid showed staphyl. alb. (which was considered a contamination).
2/9		Yellow. 12 c.c. Cell count 370. P.M.N. 57. Lymph. 43. Few R. B. C. No organisms. Culture neg.
2/14	5 c.c. Clear. Cell count 5. Wassermann neg.	Yellow. Cell count 44. Some R.B.C. Colloidal gold: 0±±1111+000.

nourished infant, weighing 12 pounds, 9.5 ounces. He was very pale, had a waxy color, and cried much.

The head was quite large, the circumference being 47.6 cm. The fontanelle was large, bulging and very tense; the sagittal suture was gaping. There was some cranio-tabes. The eyes were pushed downward, the upper margin of the iris being visible, the lower third being covered by the lower lid (visus hydrocephalicus).

The chest had a circumference of 42.5 cm. and was normal.

There was nothing abnormal about the throat and abdomen.

The nervous system was normal, except for the enlargement of the head and the increased intracranial pressure.

The skeleton showed a rosary, some thickening of the epiphyses, some craniotabes and a hydrocephalic type of head. There was no tenderness of the extremities.

The urine was normal.

The blood examination showed Hgb. 40 per cent, R. B. C. 2,150,000, P. M. N. 43 per cent, Lymph. 52 per cent, Eos. 3 per cent, Trans. 2 per cent, moderate poikilocytosis, marked anisocytosis, moderate polychromatophilia, several normoblasts.

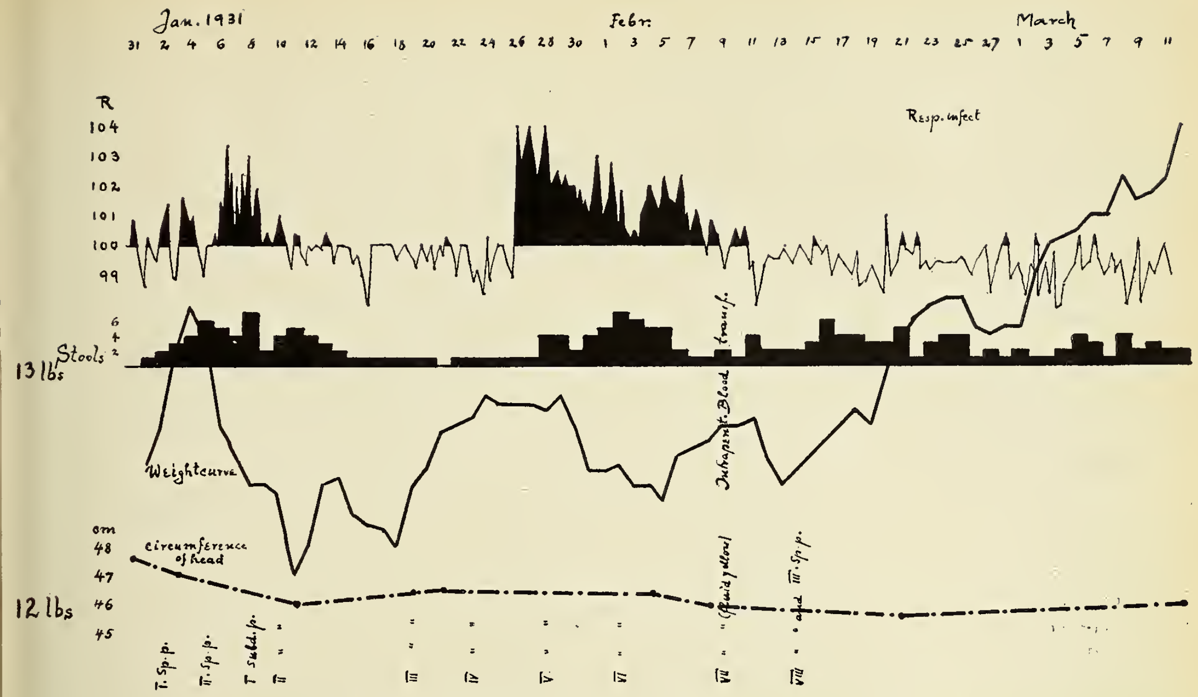
X-ray examination: The head showed thinning of the skull bones and increased separation. The bones of the forearms and legs showed definite changes due to rachitis.

Course of Disease.—January 2, 1931. A spinal puncture was performed and 30 c.c. of clear fluid were obtained under highly increased pressure. The fluid was practically normal otherwise (see table). The fontanelle was much less tense after the puncture and was hardly bulging.

January 5. The circumference of the head remained the same and the fontanelle was bulging again; another spinal puncture was done but only about 4 c.c. were obtained. The pressure was not far from normal. After the puncture the fontanelle seemed slightly softer, but was still bulging.

January 8. The child was worse, ate poorly and vomited much. A ventricular puncture was attempted on the left side but no fluid obtained, but on removal of the needle a very bloody fluid gushed out from the subdural spaces. A subdural cranial puncture in the right corner of the fontanelle produced the same fluid, which contained much fresh blood with many normoblasts, but no pigmented phagocytes. On standing the fluid did not become clearer. It was estimated that the fluid contained approximately three-fourths blood and one-fourth spinal fluid, and it was definitely somewhat browner than normal blood. The fontanelle, which was very tense before the puncture, was slightly sunken afterwards. Examination of the fundi revealed "bilateral chorio-retinitis. No hemorrhages of any consequence."

January 10. The child was very pale, listless and drowsy, but vomited less. A second subdural puncture



This chart shows the temperature curve, the weight curve, the curve of the circumference of the head and the numher of stools. The response of the intestinal tract to the rise of temperature (parenteral dystrophy) is interesting. The spinal and suhdural punctures respectively are given at the bottom of the chart.

was performed and 10–12 c.c. of very bloody fluid removed, which was perhaps a little browner; the pressure was markedly increased.

January 12. The child cried frequently, but began to eat better and vomited only occasionally. The temperature, which had been as high as 103.5 for the past few days, became lower. A blood count showed: R.B.C. 3,140,000, several normoblasts, P.M.N. 24 per cent, monocytes 2 per cent, Eos. 3 per cent, moderate anisocytosis, some poikilocytosis, slight polychromatophilia. The circumference of the head was decreased 1.5. cm.

January 19. Five days ago a decided improvement could be noticed; the patient became brighter and began to eat much better. The temperature was not over 100 for the last four days. A third subdural puncture yielded 25 c.c. of dark brownish fluid. This fluid was decidedly browner, but contained less blood.

January 21. Another examination of the fundi: "No retinal hemorrhage. Marked chorio-retinitis." The fontanelle was not bulging. The circumference of the head remained the same. The bleeding time was 3 minutes, 20 seconds, and the coagulation time 6 minutes, 5 seconds.

January 23. A second spinal puncture was performed and a perfectly normal fluid obtained, while the subdural fluid was still dark brown and under quite high pressure. In general, the child was improving. An X-ray examination of all extremities showed a mild rachitic involvement of the bones, and "there is an area of decreased density just proximal to the epiphyseal line in the right radius, which may possibly be a manifestation of associated scurvy."

January 27. Yesterday the temperature went up again (104 R.) and remained high. The child became very fussy; the examination was negative except for the head findings and rather frequent and loose stools (parenteral dystrophy).

January 28. The subdural fluid remained quite brown, but contained much less blood; the pressure was fairly high.

February 2. The fever was less severe in the last few days. The child had five to six stools a day and dropped in weight. The circumference of the head remained stationary (46.5 cm.) and there was occasional vomiting. The urine contained a trace of bile. A blood examination showed: Hgb. 51 per cent, R.B.C. 2,830,000. The subdural fluid was still brown.

February 7. The child became fussy again. There had been another rise of temperature during the last three days (102.5-103 R.).

February 9. As the child was still very anemic, an intraperitoneal blood transfusion (father's blood, 200 c.c.) was given. The temperature had decreased during the past two days, the stools became better and the child began to gain in weight. The subdural fluid became yellow since the last puncture, but the cell count was fairly high (see table).

February 13. A spinal puncture yielded clear, normal fluid. The subdural fluid (eighth puncture) was light yellow, and the cell count greatly reduced. The blood had slightly improved: Hgb. 53 per cent, R.B.C. 3,220,000, W.B.C. 8,450; Diff.: P.M.N. 44 per cent, Lymph 56 per cent, and the child seemed improved in every way.

Febuary 24. The patient was gaining in weight (12 ounces in last ten days). Occasionally the temperature was slightly elevated (100.5 to 101 R.). The circumference of the head remained stationary; the fontanelle rather sunken. The patient contracted a moderately severe respiratory infection. The hemoglobin was 55 per cent, the R.B.C. 3,580,000.

March 17. The child continued to improve in spite of the respiratory infection and a mild impetigo. The circumference of the head remained stationary; the fontanelle was rather sunken. The hemoglobin increased to 65 per cent and the last R.B.C. count was 3,350,000. The child was still unable to hold up the head. Examination of the nervous system was negative. The physical condition had decidedly improved. The weight had increased rapidly (1.5 pounds in the past month). There were signs of mild rachitis.

COMMENT

On first examination this child appeared to have a hydrocephalus internus until the subdural puncture led to the correct diagnosis. The spinal fluid remained normal throughout the sickness while there was a dark brownish, very bloody subdural fluid over the convexity of the brain which later changed to the typical yellow color. No retinal hemorrhages which are so frequently present in pachymeningitis were found, but there was a chorioretinitis.

The etiology in this case is not clear; no evidence of a severe rhinitis could be found in the history. Whether the severe secondary anemia was caused by the pachymeningitis, or rather was due to the same factor causing the pachymeningitis, could not be ascertained. The peculiar X-ray findings, which make one suspect a mild scurvy, may be of importance. A relationship between scurvy and hemorrhagic pachymeningitis has been suspected as early as ten or more years ago, but it has not been possible to prove it. In this case, however, the X-ray findings (besides the rachitic changes) are so mild and indistinct as not to permit an exact diagnosis.

This case belongs in Group I of the types of pachymeningitis hemorrhagica in infancy, as described by Rosenberg (Berlin, 1913). This is the type with a slow onset, running a course like an internal hydrocephalus, with very few symptoms from the central nervous system. The second period of high fever in this case was a rather unusual feature.

The subdural punctures were continued at first to reduce the highly increased intracranial pressure, and later only small amounts were withdrawn for the purpose of controlling the changes in the subdural fluid. The anemia was treated with iron and one intraperitoneal blood transfusion. A diet high in vitamins was given. There was a definite improvement.

The prognosis in this case seems quite good. No recurrence of hemorrhages was observed; the intracranial pressure returned to normal and no abnormal increase in the size of the head was noticed for more than one month after the last subdural puncture. That the child was unable to hold up the head or sit up when over seven months old is due in part to the mild rachitis as well as to a peculiar debility which is very frequently found after a pachymeningitis. The prognosis as to the mentality has to be somewhat guarded because a certain percentage of such children who recover have been found to be mentally retarded when examined several years later.

BILATERAL SPONTANEOUS PNEUMOTHORAX: REPORT OF A CASE*

Harry G. Wood, M.D.
Rochester, Minnesota

The exact percentage of cases of recurring attacks of spontaneous pneumothorax is difficult to determine accurately. In a series of seventy-one patients observed in The Mayo Clinic, 21 per cent gave a definite history of multiple attacks, and an additional 24 per cent gave an indeterminate history strongly suggestive of previous spontaneous pneumothorax. In 11 per cent of the series both a right-sided and a left-sided spontaneous pneumothorax had occurred at different periods, but in only three cases, approximately 4 per cent, had bilateral pneumothorax occurred simultaneously or with such a short interval that both sides showed partial collapse at the same time. The case reported here is illustrative.

A man, aged thirty years, who came to the clinic September 17, 1930, gave a history of having been apparently perfectly healthy until the age of fifteen years. Then he had an attack of sudden sharp cutting pain throughout the entire pulmonary area, most severe in the upper part of the thorax and shoulders. The pain came with inspiration; there was no pain while he was holding his breath. There was moderate cough and expectoration and some dyspnea. One treatment with a therapeutic lamp gave immediate and complete relief. The patient felt well and apparently remained in excellent health for ten years following this episode. The family history was negative for tuberculosis. The patient had been a heavy cigarette smoker and had had a chronic cough and expectoration for the last ten years. He remembered one attack of pain in the thorax about six years before admission similar to the one occurring at the age of fifteen years. This was relieved by strapping the thorax. Five years before admission, there was moderate hemoptysis on one occasion, but no history of bleeding otherwise. Further attacks of pain in the thorax had not occurred until two years previous to examination. Since then, at least five attacks have occurred, four of which were in the left side of the thorax; the other was in the right side. There were numerous other less severe attacks which may or may not have been associated with partial pneumothorax. Fever, sweating or effusion was not present. The outstanding symptoms with all attacks were pain and dyspnea with increased irritative cough and little expectoration. The pain generally began in the precordial area; became general throughout the thorax and radiated to the shoulder. It generally lasted two or three days; the dyspnea lasted from eight to ten days and there had been complete subjective relief in three to four weeks. Various diagnoses had been made, but only one roentgenogram of the thorax had been made, about ten months before admission. This showed some infiltration of both the right and left apex but no pneumothorax. The patient had been working hard and had lost weight. He stated that he tired easily. He had been made to rest more and had been placed on a supernourishing diet. In a period of three months he gained 25 pounds. Seven days before admission, without exertion, there was a sudden onset of the usual symptoms: pain, dyspnea, cough and some expectoration. He continued working part time and driving his car for six days.

---

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Submitted for publication April 1, 1931.

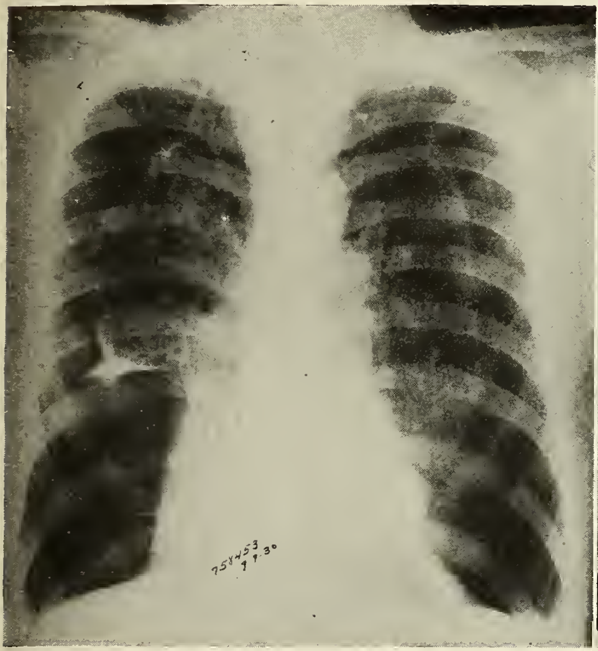


Fig. 1. Bilateral pneumothorax with multiple pleuritic adhesions on the right and definite circular line in the right lower part of the thorax, suggestive of a large emphysematous bleb replacing the right lower lobe.

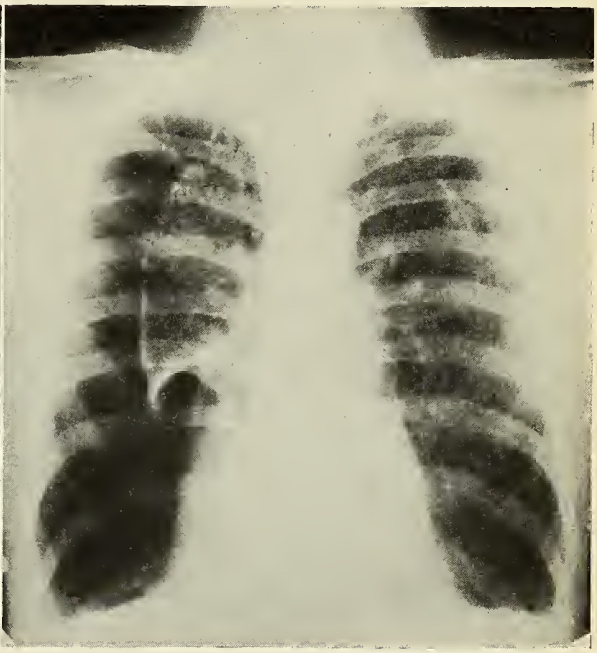


Fig. 2. Recurrent pneumothorax of the right side.

At examination in the clinic the patient looked sick; he had an anxious facial expression, he was definitely dyspneic and seemed to be in some pain. Both temperature and pulse were normal. The percussion note was hyperresonant throughout the entire pulmonary area, with marked suppression of the breath sounds, and vocal fremitus and vocal resonance were almost absent. There was no tinkle, no succussion and no coin sound. The roentgenogram of the thorax (Fig. 1) showed bilateral pneumothorax with multiple pleuritic adhesions on the right. The right lung was collapsed to approximately a fourth and the left to a half its normal volume. In this roentgenogram there was also a definite circular line showing in the right lower part of the thorax, suggestive of a large emphysematous bleb replacing the right lower lobe. Although a small amount of fluid was manifest at both costophrenic angles by roentgen-ray examination for a few days, it soon disappeared and the patient made fairly rapid subjective and objective improvement until September 27. At this time, he laughed heartily, a coughing spell followed and he became quite dyspneic, but had no pain. A roentgenogram of the thorax (Fig. 2) September 29 showed absence of the circular line in the right lower part of the thorax and increased collapse of the right lung. Apparently there had been a rupture of this cyst. The patient improved rapidly following this fresh pneumothorax, with rapid expansion of both lungs, but with recurrence of a large cyst of the right lower lobe (Fig. 3). October 18, a few minutes after slight exertion, there was sudden severe pain throughout the entire thorax and rapidly increasing dyspnea and cyanosis. The patient soon became comatose. He was placed in an oxygen chamber and both thoracic cavities were aspirated; 650 c.c. of air was removed from the left side of the thorax and 400 c.c. from the right. He immediately regained consciousness and there was gradual but continued objective and subjective improvement until he was well enough to go to Tucson for sanitarium treatment five weeks later. At this time, the right lung was completely reëxpanded with no evidence of cystic lower lobe. The left lung was almost completely expanded save for a small area of localized retraction at the apex, presumably due to adhesions.

During the period of three months that the patient remained under observation, there was no elevation of temperature or pulse and numerous examinations of sputum failed to reveal the presence of the bacillus of tuberculosis. Coincident with the expansion of the lungs, definite infiltration of both upper lobes became manifest. During the last month of observation, there was a definite increase in the extent of infiltration in the right upper lobe, with development of cavitation. The Wassermann reaction of the blood was negative and the patient maintained a high normal blood count throughout. Granular casts were found on two occasions. Moderate chronic prostatitis was present. There was no evidence of renal tuberculosis.

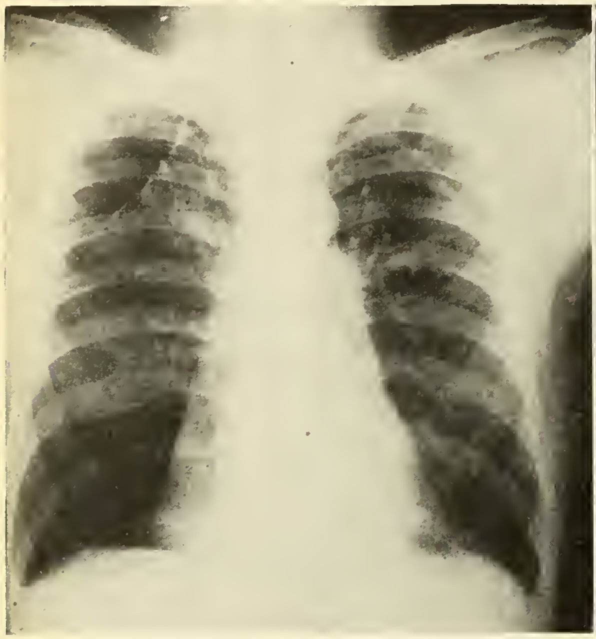


Fig. 3. Recurrence of emphysematous cyst of right lower lobe following recurrent pneumothorax.

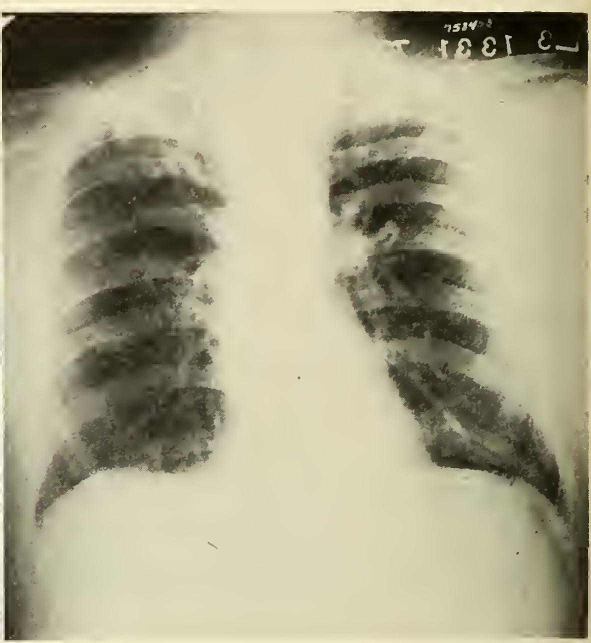


Fig. 4. Complete expansion of both lungs with improvement of the tuberculous process.

The patient complained greatly of abdominal distention with indefinite pains and soreness, but roentgenray examination of the gastro-intestinal tract was negative; the symptoms were apparently reflex in origin.

During the last three months, this patient has had sanitarium care at Tucson and has improved steadily. There has been no recurrence of pneumothorax. Roentgenograms were made March 13 (Fig. 4) and are reproduced here by courtesy of his physician, Dr. Samuel H. Watson. They show complete expansion of both lungs with a definitely lessened amount of infiltration, showing apparent obliteration of the cavity.

There are many points in this case of unusual interest. The initial spontaneous pneumothorax occurred fifteen years ago. There has been an indeterminate number of attacks since. Both sides have been involved simultaneously on at least two different occasions. The last time, the collapse was so extreme as rapidly to cause unconsciousness and there is no question that death would have followed without immediate decompression.

Definite pulmonary tuberculosis is present, and tuberculosis must be accepted as an etiologic factor. Nevertheless, frequently recurring attacks of spontaneous pneumothorax over a period of years, without temperature or occurrence of definite effusion, is more characteristic of the so-called idiopathic nontuberculous type of disease. The cystic changes occurring in the right lower lobe with rupture and recurrence of cyst are hard to explain on the basis of pleural tuberculosis. The possibility that there is more than one etiologic factor must be considered. It is probable that this patient has congenital pleural imperfections and that this condition as well as pleural tuberculosis has been responsible for the frequently recurring spontaneous pneumothorax.

SARCOMA OF THE THROAT*

REPORT OF TWO CASES

J. A. Watson, M.D.
Minneapolis

Case 1.—G. K., a male, aged 22, consulted me March 5, 1926. He first noticed in May of 1925 that his throat had commenced to hurt on swallowing. In June he had his tonsils removed, after which he kept coughing up masses of fleshy material. He had radium treatment at a certain clinic during that summer and lost about twenty pounds in weight through not being able to swallow. The diagnosis at the clinic was cancer of the throat.

---

*Read before the Minnesota Academy of Ophthalmology and Otolaryngology, Minneapolis, January 9, 1931.

Previous to this illness he had never been sick, except for measles when he was twelve years old. He very seldom had colds or coughs, had always been strong and able to work hard on the farm. The family history was entirely negative. His mother had died at fifty-one of appendicitis, his father and four sisters were all living and all in good health. The examination of the throat revealed great numbers of masses of a polypoid appearance clustered around the upper and posterior rim of the larynx and greatly resembling nasal polypi. They covered entirely the arytenoid region, one or two of the masses hanging down into the cavity of the larynx, but not reaching to any depth there. The whole right pyriform fossa was filled with large masses of the growth, giving the impression that they originated in this region.

Two specimens were removed for microscopic examination, one from the region of the right pyriform fossa, the other from the neighborhood of the left arytenoid. Smears were also taken. There were found in the smears and sections large numbers of fungoid organisms which Dr. Henrici and Dr. C. J. Watson of the University identified as Citromyces. Dr. E. T. Bell's report was as follows: "I have examined several sections of the growth from the larynx of G. K. The specimens invariably show an abundant granulation tissue growth, but I have never seen any evidence of carcinoma. The fungi repeatedly found are in my opinion the cause of this unusual growth."

Dr. Leo G. Rigler reported on the X-ray examination as follows: "The patient is of the asthenic type. The bony thorax is normal. The diaphragm movements are free and equal. The trachea is in the midline. The cardiac shadow is normal in size, shape and position for this type of individual. The hilus shadows are considerably thickened. The linear markings are moderately increased, especially in the right lower lobe.

"There is evidence of interlobar pleurisy between the middle and upper lobes on the right side of very slight extent.

"Right Lung: The apex and upper lung field is clear. In the lower portion of the right lung there is a number of small nodular shadows about 2 mm. in diameter and one large nodular shadow which is anterior and out near the periphery about 0.5 cm. in diameter.

"The exact nature of these shadows is not entirely clear. They are rather dense and might correspond to a healed tuberculosis. They could, however, be associated with aspergillosis, although there is no evidence of cavitation such as usually occurs in this condition.

"Left Lung: The apex and outer lung fields are clear.

"Conclusion: Nodular lesion, right lower lobe. Etiology not clear."

On March 19 it was apparent that something must be done to save the patient from death by inanition, if not by asphyxia, as he was unable to swallow and there were times when there was a certain amount of dyspnea. Consequently, large amounts of the pathological tissue were removed, the work being done under indirect laryngoscopy. There was very little bleeding; most of the growth was bitten away by forceps. Within a week the growth was nearly as large as before and it was necessary to repeat the procedure many times in order to give the patient some relief. Radium and X-ray therapy were both used without result. Repeated microscopic examinations of the growth always brought a report to the same effect, namely, abundant granulation tissue, but without any evidence of malignancy. Numerous specimens, large and small, from all portions of the growth were submitted, and there was always an abundance of Citromyces. Because the patient was evidently doomed without some more radical procedure and because so far it had been impossible to find any tissue which gave microscopic evidence of malignancy, access was finally gained to the throat by means of a pharyngotomy. After tracheotomy and the insertion of a tube, the hyoid bone was divided in the center by a vertical incision, from the upper end of which a horizontal incision was made reaching to the anterior border of the sterno-hyoid muscle. By careful dissection through the depths of the neck and retraction of the triangular flap, it was possible to gain good access to the throat. All of the growth apparently was removed by means of the diathermy knife. In the depths of the pyriform fossa, however, one was so close to the carotid vessels—the pulsation of which could be felt under the finger with apparently almost no intervening tissue—that there was from the beginning doubt as to complete eradication in that direction. The rest of the growth was followed and as was hoped, destroyed everywhere. The tracheotomy wound was kept open for many weeks. The patient recovered satisfactorily and for a long time the outlook seemed hopeful. In about two and one-half months recurrence was evident in the depths of the right pyriform fossa, and it was not long until the same tedious and disagreeable process of removing masses piecemeal in order to prolong the patient's life was, perforce, resorted to.

In January of 1927 the patient returned to the clinic, where he had been first treated, for inspection, and I received a letter from them stating that they had again examined the tissue which I had sent with the patient and that the diagnosis was carcinoma, grade four, the same as at the time of the original examination. The conflicting reports were most puzzling, especially in view of the history and clinical course of the disease. The man's age, twenty-two, was certainly against the growth being carcinomatous. The fact that even after the last year and a half of observation, nearly a year of it by myself and my partners, there was at no time any evidence of involvement of the cervical glands, was still more strongly against the probability of the condition being carcinomatous. Specimens were again sent to Dr. Bell, who now reported that the growth was certainly not carcinoma, but that there were evidences in the later specimens of commencing sarcomatous degeneration. The issue being joined, a quantity of specimens was sent to Dr. James Ewing at the department of Pathology, Cornell University Medical College. Some of these were specimens taken early in the history of the case, others those taken later. Dr. Ewing's report follows: "In the case of G. K. sections of tumor of the larynx which you send me show a very cellular myxosarcoma. In the sections taken a year ago, I find nothing but granulation tissue, or chronic inflammation of the submucosa. In all the other sections and especially in the last one, number five, there is a very cellular and large oval cell tumor which surrounds blood vessels and shows the typical structure of nasopharyngeal myxosarcoma.

"In my experience this is a very malignant tumor and very few cases are cured. Burnham and Kelly's Institute seems to have cured one case by keeping up small external applications of radium for a year or more. This case is reported in the "Archives of Surgery," 1923, 6:429. We have lost several cases at the Memorial Hospital by attempting to destroy the tumor by surgery or caustic radium. We now have some cases under treatment by repeated moderate doses of external radiation. If you attempt to remove or cauterize these cases, they eventually become infected and die from sepsis or hemorrhage, whereas slower restraint to growth can somtimes be obtained by the less violent radiation methods."

In this case, however, hemorrhage was not the cause of the eventual death, and, while sepsis played some part in the production of the exitus, the patient died mainly as a result of inanition, as for some weeks before the end it was almost impossible to administer nourishment or even water. The growth extended downwards into the esophagus and even involved the tracheotomy wound, though it was possible to keep the tracheotomy tube clear until the last.

Case 2.—Mrs. E. I first saw this patient on July 23, 1928. Nine or ten months previously she first experienced a feeling of not being able to breathe or swallow on lying down. She had since been under treatment with radium and local applications, but no exact diagnosis had been made. A laboratory examination by Dr. Bell of the University had shown granulomatous tissue only. A growth had been discerned by her family physician on the right side of the throat. The Wassermann and all other tests were negative. My partner, Dr. W. E. Patterson, had seen the patient in consultation during my absence from the city; he believed it to be malignant and I agreed with him on my first examination.

Examination disclosed a large mass protruding from the right side of the hypo-pharynx in the upper part of the pyriform fossa. The tissue appeared to be of firmer consistency than in the former case. There was considerable infiltration of the pharyngeal wall around the protruding portion of the growth, which was large enough to produce some pressure against the larynx and epiglottis. There was very little appearance of redness or congestion of the mucous membrane. The growth was sessile and larger than one-half the size of a walnut; there was no involvement of the cervical glands.

The patient's general health was good. Physical examination disclosed nothing of importance. She had been having some pain in the right side of her throat and in the right ear, and the act of swallowing produced considerable discomfort.

At my suggestion she was referred to a prominent Chicago laryngologist for consultation. He believed the tissue to be granulomatous and non-malignant and proceded to remove it by electro-coagulation. He submitted the tissue to microscopic examination and was confirmed in his opinion of non-malignancy, writing us a letter to that effect. An examination, however, of later sections caused his pathologist to change his mind and a second letter reported that the former opinion had been revised, the growth now proving to be fibrosarcoma.

In March of 1929 the patient came to my office. There was a large scar at the site of the growth and I feared that there were signs of recurrence. When she next returned, in about six weeks or two months, there was a very considerable mass with odor and discharge. I advised her to return to Chicago. Since that time several operations have been done by means of electrocoagulation, the growth always showing an invincible tendency to recur.

Sarcoma of the throat is certainly rare as compared with carcinoma. It occurs much earlier in life as a rule than the latter disease, which is a diagnostic point that should be taken into consideration. In sarcoma the cervical glands are rarely involved, or, if at all, not until late. In the history of intrinsic carcinoma of the larynx, they are almost always involved before the disease has run any very lengthened course. This observation as to glandular involvement is, of course, equally true of the two diseases in other parts of the body.

There are certain lessons to be drawn from these two cases. Even though the microscope shows no malignancy, all so called granulomatous tissue in the throat should be looked upon with extreme suspicion. Negative microscopic evidence should certainly never be taken as conclusive in the face of any persistent mass, in this situation at least. I think that the very term granulation tissue should make a more exact diagnosis imperative. Granulation tissue has an underlying cause and it is early in the history of such masses that the cause must be found. If they do not yield very readily to mild local applications, if there is no reason to suspect any local inflammatory condition, no increased leukocyte count, no elevated temperature, no benign cyst formation, no positive Wassermann, no evidence of tuberculosis, and in short no apparent reason for it, the mass should be considered malignant, in spite of a microscopic diagnosis of "granuloma" or "granulation tissue growth."

Such a diagnosis of malignancy, even though it be more tentative than positive, having been made, the question of treatment arises. I believe that sarcomatous growths in the throat are almost hopeless, yet it has always seemed to me that in the first of these two cases, even though the very radical procedure of pharyngotomy and the diathermy knife was undertaken at a late stage in the history of the disease, it came within a measurable distance of a cure. Furthermore, I believe that he might even have been cured had it not been for a very close proximity of the growth to the great vessels of the neck. Possibly the vessels should have been ligated, but at the time of operation he was in no condition for it, and there was ground for hoping that the eradication was complete.

It is true that the primary site of the growth in this particular case may have been very close to the great vessels and that even if that very radical procedure had been undertaken a year or more before it was, it could not then have been eradicated. Nevertheless, I feel that valuable time was lost by temporizing with the condition. In the second case, profiting from my experience in the first, and in view of the fact that radium had already been repeatedly tried, I advised the friends to choose between one of two courses: first, to leave the growth entirely alone with the possible continuation of radium treatment or, second, to resort to the radical procedure of pharyngotomy. I believe that my advice was justified by the outcome, as the condition has become manifestly hopeless. The disease has invaded the bodies of the fourth and fifth cervical vertebræ. The patient is breathing through a tracheotomy tube and is being fed through an artificial opening into the stomach.

DOUBLE BRANCHIAL CYSTS COMPLICATED BY CARCINOMA OF THE LARYNX*

Arthur L. Herman, M.D.
Minneapolis

The following case has two independent features, each of which is important for different reasons. The first is the branchiogenic nature of a carcinoma of the larynx, to which a review of the literature shows no parallel. The second is the existence of two branchial cysts on the same side of the neck, the possibility of occurrence of which has been denied according to certain theories regarding the origin of branchial cysts and fistulæ.

The patient, a male, fifty-one years of age, was first seen March 21, 1927, some two months after the onset of symptoms. These consisted of a hoarseness and tenderness in the left side of the neck and followed an acute coryza.

Twenty years previously the patient had been confined to a tuberculosis sanatorium for several months but had no symptoms of activity since. He had had a gastro-enterostomy performed one year previously for a duodenal ulcer. At that time no masses were noted in the neck. His wife had died of a luetic aortitis.

Upon examination the tonsils and pillars were found to be injected. The deep cervical glands on the left were very hard and fixed. Two certainly, and possibly three, were noted. From the character of the glands malignancy was suggested.

The left vocal cord was found to be immobile. There was a smooth, elevated, reddened mass in the left recessus piriformis over which the mucous membrane was intact. X-ray of the chest was normal in appearance and the Wassermann was negative.

On the basis of these preliminary findings, the most likely diagnosis seemed to be carcinoma of the pyriform sinus, with metastases to the deep cervical glands.

Supporting this diagnosis were the age of the patient, the nature of the onset of the disease and the character of the masses palpated on the side of the neck.

Because of his confinement in a tuberculosis sanatorium, tuberculosis was considered, although there were no chest findings either on physical or X-ray examination.

Lues was also considered because of the fact that his wife had been infected. However, the Wassermann was negative and there were no other clinical signs suggesting lues.

These were the only possibilities considered at this time.

The possibility of branchial cysts was not even considered, for a branchial cyst has been always described as a single, solitary mass and in this case there were multiple masses. Hamilton Bailey reported a case of branchial cysts which upon section showed numerous tubercle bacilli. Some such bizarre combination perhaps should also have been kept in mind.

On March 25, a biopsy was performed. Upon excising part of the wall of one of the masses, a white, cheesy material escaped under considerable pressure. We fell into the common mistake of thinking we were dealing with a tuberculous lesion. Microscopic section, however, showed a cyst wall and a diagnosis of branchial cyst was made.

It was interesting to note that on the following day the patient's voice was strikingly improved. We explained this by the relief of pressure on the vagus or recurrent laryngeal nerve.

Aphonia due to pressure by branchial cysts have been reported by Carp and Thompson. Carp thought that the aphonia was due to pressure on the vagus. Thompson has reported a case with dysphagia, pain and aphonia, with fixation of the left vocal cord. At operation the cyst was found to be attached to the left lamella of the larynx and the greater cornu of the hyoid. Following the operation there was complete restoration of the voice.

In our case, following this temporary improvement after the biopsy, the voice became gradually worse. By this time we felt that we were dealing with a branchial cyst of the larynx and a separate branchial cyst of the neck.

The question of the proper procedure arose, *i.e.*, whether it would be better after a preliminary tracheotomy to do a section of the larynx and excise the cyst; or to excise the branchial cyst in the neck first and remove the cyst in the larynx at a second operation; or third, to do a tracheotomy and then later to remove both the cysts at one operation.

In deciding upon the procedure to follow, we perhaps allowed ourselves to be unduly influenced by the remarkable relief secured by lessening the pressure in the cyst as a result of the biopsy. It was felt that considerable relief could be obtained by removing the branchial cyst in the neck first and then the cyst in the larynx could be attacked later if the patient was not sufficiently relieved of his symptoms.

---

*Thesis presented before the Minneapolis Surgical Society at the meeting of January 6, 1931.

Accordingly, on June 3, 1927, an incision was made along the anterior border of the sternomastoid. A cyst was found fairly superficially. It was dissected out according to the method described by Hamilton Bailey, *i.e.*, about half the contents were drained off and then the cyst was grasped with a sponge-holder and two small squares of gauze. On making traction, a piriform projection of the cyst was found to run upward. By bluntly dissecting this it was found to run upward between the internal and external carotid arteries and became frayed out just before it reached the region of the tonsil. Further exploration of the neck revealed a second cyst. This cyst had a similar projection which extended horizontally between the jugular vein and the common carotid artery, and seemed to pierce the wall of the larynx. As much as possible of this projection was removed with the cyst. These two cysts were each about two centimeters in diameter. They were entirely separate from one another, one evidently corresponding to a second, and the other to a third branchial cleft derivation. The piriform projection of the upper cyst had the classical relation to the carotid arteries, passing between the internal and external carotids. The tract of the lower, however, passed in front of the carotid instead of behind it as usually described.

When this patient was discharged from the hospital it was noted that his voice had again greatly improved.

A new symptom, pain upon swallowing, appeared during the month following the operation. This pain seemed to be localized in the region of the left tonsil. The left tonsil was seen to gradually enlarge and to project more and more into the pharynx. This pain could be entirely relieved by anesthetizing the left tonsil and its pillars.

Since it was felt that this condition was probably due to the fact that some of the tract had been left behind, tonsillectomy was performed with subsequent alleviation of the pain.

On August 12, about two months after the removal of the cysts, two distinct, very hard masses were palpated behind the sternomastoid muscle.

A week later there was a sudden reappearance of the pain upon swallowing. This pain was much more severe than it had been previously. The swelling in the left piriform fossa seemed to be larger and redder and the mass in the left posterior triangle of the neck was definitely larger.

A few days later, on August 27, he coughed up a considerable quantity of blood and pus, following which the pain was considerably relieved.

Laryngoscopic examination showed the mass in the left piriform fossa to be smaller, paler, and apparently shriveled.

By October 21, there was evidence of laryngeal obstruction. The patient was referred to Dr. Lerche for tracheotomy. Prior to the tracheotomy, one of the glands was removed from the neck. Microscopic examination showed squamous cell carcinoma.

Laryngoscopic examination on January 20, 1928, showed increase in the size of the mass in the larynx. There were many more glands externally.

The patient died April 21, 1928, fifteen months after the onset of symptoms. No autopsy was obtained.

Examination of the first biopsy and of the two branchial cysts was made by Dr. W. A. O'Brien. He found no evidence of malignancy in either of these specimens.

In spite of the impossibility of autopsy confirmation, it seems reasonably certain that this condition was one of branchiogenic carcinoma on the basis of a branchial cyst of the larynx with metastases to the glands of the neck. This picture was further complicated by the presence of two benign branchial cysts of the neck.

Just when the metastasis to the glands of the neck took place cannot be accurately determined, although it is my belief that it had already taken place when the patient first consulted me and that the second implantations were too small to be seen or were not in the operative field at the time the branchial cysts were removed.

Subsequent to removal of the two branchial cysts, gradually enlarging masses appeared posteriorly to the incision. On account of their location and because of the fact that the branchial cysts showed evidence of marked chronic inflammation with considerable thickening of their walls this enlargement was at first looked upon as inflammatory and its true character overlooked. That these metastases were secondary to the growth in the larynx seems indisputable since there was no other primary focus demonstrable. That the growth in the larynx was branchio-genic in origin seems to be established by the fact that there were other branchiogenic rests present. That it was cystic is proved by its appearance and its subsequent rupture and drainage of cyst contents, and that it was malignant, by its continued growth even after spontaneous drainage of its contents.

DISCUSSION

To show clearly the embryologic significance of the occurrence of two distinct branchial cysts, each of which has a separate tract, one pointing toward the pharynx and the other toward the larynx, is not permitted by the limited time at my disposal, so I shall omit all discussion of this interesting feature and discuss briefly branchiogenic carcinoma of the larynx.

Malignant degeneration of a branchial cyst was first reported by Von Volkman in 1882. McFarland's report in 1926 brought the number of cases to 359. Belk in 1927 reported ten cases. Most figures regarding the number of these cases are undoubtedly too high because of the fact that different authors employ varying criteria in establishing a diagnosis. For instance, by many, mixed tumors of the parotid are included under the head of branchiogenic tumors. Furthermore, many call all malignant tumors of the neck, which have no demonstrable primary focus, branchiogenic tumors.

When we bear in mind that many cases have been called branchiogenic tumors even without postmortem examination to rule out a primary focus, it is apparent that many cases so reported are not branchiogenic carcinoma at all but are secondary to undemonstrated minute primary foci in the nasal sinuses or the larynx. The only lesions whose branchiogenic origin can be established beyond doubt are those which have a cystic structure so that it can be reasonably assumed that the carcinoma began on the basis of a branchial cyst. In solid tumors suspicion always remains that they are secondary and the primary lesion has been overlooked. This fact has been previously stressed by Carp and Stout, by McKenty, Richardson, Brandt and Hudson.

If we include only cases which are undoubtedly malignant degeneration of pre-existing cysts, this condition becomes much rarer than the literature suggests.

One such case has been reported by McKenty. Roeder has reported a case which was operated upon by removal of all the structures from the right side of the neck. This patient was well four and one-half years after the operation.

Schriener reports 16 cases out of 7,376 records since 1914, although whether these are all strictly branchiogenic carcinomata might be reasonably doubted for the reasons stated above.

Carp and Stout, out of 3,961 neoplasms observed at the Presbyterian Hospital and of which 1,538 were cancers, found only four of branchial origin.

According to Ewing, these tumors are of two types —solid and cystic; the usual form being cystic. Ewing further states that definite information in this field is lacking.

The treatment of this type of tumor is most discouraging. Except for Roeder's patient who was apparently well four and one-half years after a very radical operation, all of the cases ended fatally, a few months after recognition. X-ray and radium therapy seem to be of little if any avail.

In the literature, I have not come across a case of branchiogenic carcinoma of the larynx. Even benign branchial cysts of the larynx are extremely rare.

In 1929 Imperatori operated on a branchiogenic cyst of the larynx by thyrotomy, with complete recovery.

In 1928 Watson reported a case in which the cyst encroached upon the glottis and caused sudden suffocation and death. It is of interest to note that in this case the voice, prior to the fatal attack, had never been affected.

Rosenberger reported a cyst in a new-born, causing increasing dyspnea with death from suffocation, after four weeks.

CONCLUSIONS

Early diagnosis of malignancy seems very difficult. Treatment after the malignant stage has been reached seems very ineffective, although the very radical method suggested by Roeder offers some promise. Because of the relative frequency of malignant degeneration it seems justifiable for this reason alone to remove all branchial remnants as soon as they are recognized.

BIBLIOGRAPHY

1. Belk, William P.: Branchiogenic tumors of the neck. Surg. Clin. N. Amer., 7:453 (April), 1927.
2. Brandt, G.: Beitrage zur Frage des branchiogenen Karzinoms." Deutsch Zeit. f. Chir., 187-188:15-21, 1924.
3. Carp, Louis: Branchial fistula, its clinical relations to irritation of the vagus. Surg., Gyn. and Obst., 42:772, 1926.
4. Carp and Stout: Branchial anomalies and neoplasms. Ann. Surg., 87:186 (Feb.), 1928.
5. Ewing, James: Neoplastic diseases. 1928, p. 1021.
6. Hamilton, Bailey: The clinical aspects of branchial cysts. Brit. Jour. Surg., 10:565 (April), 1923.
7. Hudson, Rupert Vaughan: The so-called branchiogenetic carcinoma, its occupational incidence and origin. Brit. Jour. Surg., 14:280, 1926.
8. Imperatori, Charles J.: Branchiogenetic cyst of larynx. Removal by thyrotomy. Laryngoscope. 39:679, 1929.
9. McFarland (quoted by Belk): Branchiogenic tumors of the neck. Surg. Clin. N. Amer., 7:453 (April), 1927.
10. McKenty, F. E.: Tumors of the neck. Surg., Gyn. and Obst., 19:141, 1914.
11. Richardson, Morris L.: Branchogenic carcinoma with report of a case. Cleveland Med. Jour., 14:581, 1915.
12. Roeder, C. A.: Malignant degeneration of a branchial cleft remnant. Removal of all structures from the right side of the neck. Jour. Am. Med. Assn., 93:103, 1929.
13. Rosenberger, H. C.: Cyst of the larynx and lobus azygos of lung. Laryngoscope, 37:360 (May), 1927.
14. Schreiner, Bernard F.: Results of treatment of tumors of branchiogenic origin. Surg., Gyn. and Obst., 48:507, 1929.
15. Thompson, J. W.: A case of branchial cyst (with dysphagia, dyspnea, and aphonia). Lancet, 212:76 (Jan. 8), 1927.
16. Von Volkman, Richard: Das tiefe branchiogenen Halscarcinom. Zentralbl. f. Chir., 60:49, 1882.
17. Von Volkman: Ueber die branchiogenen Karcinom. Klin. Chir., 23:595, 1899.
18. Watson, W. R.: Aberrant branchial cyst encroaching on the glottis and causing suffocation and death. Arch. Otolaryngol., 7:57, 1928.

PRESIDENT'S LETTER

THE Seventy-Eighth Annual Meeting of the Minnesota State Medical Association is now history, and, therefore, thanks, appreciations and certain retrospective reflections are in order.

Perhaps the most conspicuous thing revealed by each of these great state gatherings of medical men is the large number of busy, important men who are taking an active part in the routine detail of the affairs of organized medicine in Minnesota.

More than twenty committee reports were received and acted upon in two brief House of Delegates sessions, representing the year-long, hard work of an infinitely greater number of men. I am disposed to challenge any other organization, of whatever kind, in Minnesota to exhibit a comparable interest and willingness to work on the part of its members.

It is worthy of note that the House of Delegates worked efficiently and well, and with extraordinary harmony. These two sessions, with the council meetings that preceded and followed them, constitute an outstanding example of what great bodies of men may accomplish, given willingness to work and the sense and intelligence necessary to participate in the give and take of discussion without acrimonious feeling.

Expressions heard from the floor of the house were unanimous in their appreciation of the year's work of the committees, particularly of the great major committees, the Public Health Education, and that on Public Policy and Legislation. These committees are all engaged in the business of transforming the profession of medicine in Minnesota from a collection of unrelated units to a powerful, responsive and responsible instrument, competent both to assume proper leadership in a public-health-minded world and to protect both itself and the public against irresponsible, socialistic experiments.

The special committee appointed last year to study the policies of the organization made its first report at this meeting. This committee was composed of five busy practitioners, and the report they prepared, which obviously required a great deal of time and careful study in its compilation, was a conscientious, sane, unbiased appraisal of the worth of our activities, with equally sane and well considered recommendations for the future. The report was thoughtfully considered, both by the Council and the House of Delegates, and the discussion which it prompted in both bodies will remain one of the high points of the 1931 meeting. It is by such unprejudiced, impersonal self-estimations that great organizations, as well as individuals, keep their perspective and continue to direct their energies toward wise and essential ends.

A new committee was formed at this meeting, likewise, which is directed at the most vital present problem of medicine. This is the Committee for the Study of the Problem of Medical Economics. No one who attended this meeting, or who picks up any of the better class lay magazines on the news stands can fail to be impressed with the great need for such studies among practical, practising medical men. Curiously enough, it is the sociologist, the social worker, the school man, the public health worker, the employee of the scientific foundation, who has offered most of the testimony hitherto and dug up most of the accepted facts. It is none too soon for the practising physician to make his contribution. Such a study as this committee contemplates is no vague research thrusting at shadowy adversaries. It must be a practical fact-gathering body looking to some immediate practical program for the adjustment of our own economic problems. It deserves the best brains and efforts which our association can muster. It will have a high function to perform in the medical rearrangements of the future, a heavy burden of responsibility for the proper steering of our course out of present economic entanglements. Of that we should all be well aware.

I wish to recall the graceful tribute, with its accompaniment of a gift, which was bestowed upon Dr. Workman, at this meeting, for his years of loyal service and hard work for the association. It was a pleasant incident of the banquet and of the meeting. Dr. Workman has deserved well of our association. He has worked without the slightest thought of a reward and sometimes, no doubt, it has seemed a *thankless* task. He now knows that he always has had the respect, gratitude, and loyalty of his associates.

In closing may I add this bit from Lowell Hoyt? It seems to me a very pertinent quotation.

> "It is spring. Things are looking better. Folks feel better, but a lot of encouragement is needed. Everybody should be a disciple of optimism. Talk it. Act it. It is contagious, makes people forget past failures and the faults of others, and it will inspire them with finer courage, greater enthusiasm and a new hope and new spirit of accomplishment."

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE
A. S. HAMILTON, M.D............Minneapolis
D. C. BALFOUR, M.D............Rochester
J. T. CHRISTISON, M.D............St. Paul
E. L. GARDNER, M.D............Minneapolis
JOHN M. ARMSTRONG, M.D............St. Paul
R. E. FARR, M.D............Minneapolis

CARL B. DRAKE, M.D., St. Paul............Editor
Lewis M. Daniel, M.D., Minneapolis............Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna............First District
F. M. Manson, M.D., Worthington............Second District
Geo. B. Weiser, M.D., New Ulm............Third District
H. B. Aitkens, M.D., LeSueur Center............Fourth District
F. U. Davis, M.D., Faribault............Fifth District
E. L. Gardner, M.D., Minneapolis............Sixth District
Paul Kenyon, M.D., Wadena............Seventh District
O. E. Locken, M.D., Crookston............Eighth District
E. L. Tuohy, M.D., Duluth............Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV June, 1931 No. 6

STREPTOCOCCUS VACCINATION IN CHRONIC ARTHRITIS

The classification of arthritis is at present unsatisfactory. While the etiology of certain forms of arthritis is known, there is no agreement as to the cause of acute rheumatic arthritis and chronic arthritis—hypertrophic, atrophic, rheumatoid—call it what you will.

Clinically acute rheumatic arthritis, subacute bacterial endocarditis, and infectious arthritis have been considered separate entities, although confusion in diagnosis occasionally may occur. Pathologically the endocardial lesions in the first two diseases mentioned, while usually easily differentiated, are certainly at times similar and may occur simultaneously. The Streptococcus viridans has been established as the cause of subacute bacterial endocarditis. Clawson's finding of a green-producing streptococcus in an appreciable percentage of cases of acute rheumatic fever has convinced him of the identity of the two diseases. It is rather startling to have him announce that he has identified the same organism from the blood in fifty per cent of chronic arthritis cases, indicating the common etiological factor in the three diseases.

Immunological studies of the blood in acute rheumatic arthritis cases by Birkhaug and Swift, Clawson, and others have shown these patients to be hypersensitive to streptococci. Clawson has shown by experiments on animals that hypersensitiveness to streptococci can be produced by subcutaneous inoculation of streptococci and agar, with the production of an abscess, and further that these animals can be desensitized by intravenous (not subcutaneous) injection of streptococcic vaccine. Extending these observations to clinical application, patients with not only acute rheumatic fever but with chronic arthritis have been and are being treated by intravenous vaccination with a streptococcic vaccine. This is not the first time that vaccine or even streptococcic vaccine has been recommended for chronic arthritis. Typhoid vaccine intravenously in these cases has been tried extensively with but only a modicum of success. Coley's fluid has had some vogue. Clawson's experiments seem to indicate that the desensitizing effect is not due to a foreign protein but can be obtained by various members of the streptococcus family. He is using in his clinical experiments a stock culture of a Streptococcus viridans derived some eight years ago from the blood of a patient suffering from acute rheumatic arthritis.

As a result of the untimely lay publicity regarding the clinical trial of this vaccine in chronic arthritis patients, Dr. Clawson has been swamped with letters from sufferers in every state in the union and physicians have been importuned to get by hook or by crook some of the new vaccine. It is unfortunate. Dr. Clawson himself admits the work is in an experimental stage and has wisely refused to distribute the vaccine widely. Those who heard him speak at the state medical meeting and who heard Dr. Wetherby describe the clinical phase of the work being done, know that conclusions as to the ultimate value of the administration of streptococcic vaccine intravenously in chronic arthritis cannot be drawn. Dr. Clawson is a careful observer and it is certainly to be hoped that his studies will add to our woefully limited means of treatment of this disease.

THE STRANGE CASE OF DIABETES

It is startling to learn that the mortality from diabetes in this country has shown a decided increase in spite of the discovery of insulin. It seems impossible. The discovery of insulin has been rightly hailed as one of the outstanding triumphs of medical science during the past decade, and its use in diabetes has proven invaluable in the prevention of death from coma and in obviating the necessity of markedly restricted diabetic diet. So striking has been its effect that the impression has been given by no less authority than Dr. Joslin that there is no excuse for a diabetic dying from his diabetes. This is doubtless an overstatement of the case. On the other hand, the prevention of many deaths from coma and the prolongation of life in youthful diabetics would naturally increase the percentage of diabetic deaths due to concomitant arterial diseases.

The February 5 number of the *Spectator* contains an article by no less an authority than Frederick L. Hoffman, Consulting Statistician of the Prudential Insurance Company, entitled "The Diabetes Record of 1929," which compares the mortality from diabetes in pre-insulin and post-insulin years. For fifty American cities, the death rate has mounted from 15.9 per 100,000 in 1912 to 23.3 in 1928, declining in 1929 to 22.9. Comparing the mortality rates for the years 1920 and 1927 in the registration area of this country, the reduction in both sexes during the youthful decades has been marked, while in the later decades the increase is startling. It is interesting to note that, while the mortality is slightly greater for the female sex in the first two decades of life, this predominance in the female sex is markedly in excess in the later decades. Comparing the figures for 1920 with those of 1927, this increase in mortality begins to make itself apparent after the age of fifty in males, whereas in females it becomes more apparent at the age of thirty-five. Another striking feature brought out is the marked variation between the mortality from diabetes in different cities, and from year to year in the same city.

What explanation can be given for this disappointing result?

In the first place diabetes is unquestionably more frequently diagnosed than formerly. The much more frequent life insurance and periodic health examinations of recent years have resulted in the detection of many unrecognized cases of diabetes. In former years, the associated existence of diabetes was doubtless often overlooked in patients dying of stroke, heart disease and gangrene.

This, however, does not explain the total increase in diabetic mortality. Certain other facts play a part. In the first place, diabetics are notoriously lax in their adherence to a restricted diet. The expense of daily insulin administration frequently results in its discontinuance. Then again insulin has little effect in the presence of acute infections and the diabetic has a poor resistance to various infections.

In view of the known facts, it seems highly probable that the incidence of diabetes in this country has greatly increased. This view is supported by a comparison of mortality records in this country with those of foreign countries. Compare the figure of 18 per 100,000 in our country at large with that of 11.4 in England and Wales and 6.3 in Italy for the year 1926.

It is not unreasonable to look for some fundamental error in our national diet to account for the picture. The increase in the per capita consumption of sugar in this country from 79 pounds in 1915 to 110 pounds in 1927 is suggestive if our ideas of obesity and overconsumption of carbohydrate as etiological factors in diabetes are correct. Here is a definite opportunity for the medical profession to advise the public of the probable danger that exists in the present day overindulgence in candy and sweets.

UNVERSITY HOSPITAL STAFF REPORTS

The writer has recently had the loan of an unusual document developed intramurally by the University of Minnesota Hospital staff. In addition to a report of the clinico-pathological weekly conference and some snappy news items, the necropsy reports are interspersed with timely comments and deductions. But the most striking feature consists of the unusual abstracts from the literature, usually inspired by the cases under discussion and study.

Students and practitioners have long wanted some reliable, authoritative, easily available statement of current opinion or expression on outspoken clinical entities or syndromes. Text books rarely meet the need because so all-inclusive; much specific information is widely dispersed. A good text is scarcely written before it is incomplete. Then not all doctors have easily available the library and journal facilities found at our universities.

Therefore a set-up of "abstracts" dealing with a subject like "Jaundice" or "Lung Malignancy" has a mine of fresh, vivid and useful information, quickly orienting the reader to permit him to meet patients who have such disorders with greater decision and accuracy. It is to be hoped that in time these reports will expand into a publication for general use and distribution.

E. L. T.

OBITUARY

Dr. O. S. Neseth

1886-1931

Dr. O. S. Neseth of Kenyon died April 23, 1931, following an attack of influenza and pneumonia.

Dr. Neseth was born in Kenyon Township on December 25, 1886. He attended the Red Wing Seminary and obtained his medical degree at Northwestern University.

During the World War Dr. Neseth served as First Lieutenant in the Medical Corps. After practicing a few years in Decatur, Illinois, he moved to Kenyon shortly after the death of Dr. J. A. Gates in the summer of 1923.

Dr. Neseth was Master of the Masonic Lodge at Kenyon at the time of his death and a member of the Odd Fellows Lodge. He was also a member of the Rice County Medical Society, the Minnesota State Medical Association, and the American Medical Association. He was an ardent fisherman and a great devotee of the game of golf.

Dr. Neseth is survived by his wife, Julia; a niece, Mamie Keller; his father and mother, Mr. and Mrs. Sever Neseth; three brothers, Nels, Fred and Carl; and two sisters, Christine and Clara.

Charles Sumner Bigelow

1845-1931

Dr. Charles Sumner Bigelow was born at Middlebury, East Akron, Ohio, December 15, 1845, and died suddenly at his home in Lynwood, California, April 13, 1931, at the age of eighty-five years. He was buried in Roosevelt Cemetery there, April 15.

Dr. Bigelow served in the Civil War in Co. F., 3rd Regiment, Wisconsin Volunteer Infantry. He graduated in Medicine and Surgery at the University of Michigan in 1873. That fall he was married to Miss Abigail Alma Pierce, from which union five children were born. He came to Claremont, Dodge County, Minnesota, in 1881, where he remained for three years. He went to Kansas for the next six years and returned to Dodge County in 1890. He located at Dodge Center, where he practiced until he retired in 1912.

Mrs. Bigelow died in 1910 and Dr. Bigelow was remarried to Miss Neva Bromley of Dodge Center, in 1916. They made their home at Two Harbors, Minnesota, until 1925, when they moved to California.

Dr. Bigelow served the people of Dodge Center for twenty-two years and was well known throughout the country. He was a member of the Masonic Lodge, the Knights of Pythias, Congregational Church and many other local organizations for many years.

Dr. Bigelow was a member of the State Medical Association for many years and was instrumental in organizing the Dodge County Medical Society in 1905.

Besides his many friends, Dr. Bigelow leaves to mourn his passing, his wife, Mrs. Neva Bigelow, two daughters, Mrs. Delia Pierce and Mrs. Chris Darsnek, two sons, Dr. Charles Bigelow and Major Albert S. Bigelow.

PERTUSSIS VACCINES OMITTED FROM N.N.R.

The Council on Pharmacy and Chemistry reports that pertussis bacillus vaccine was admitted to New and Non-official Remedies in 1914 on the basis of what appeared to be acceptable clinical evidence. In subsequent years, when vaccine therapy was at its height, pertussis bacillus vaccine was used extensively and yet critically controlled reports did not become available. In 1928 the Council voted to omit pertussis vaccines with the close of the longest period for which any one was accepted, unless in the meantime acceptable evidence for its usefulness in the prevention or treatment of whooping cough became available. No acceptable confirmatory evidence having become available, the Council voted to confirm its decision to omit from New and Non-official Remedies all pertussis vaccines. (Jour. A. M. A., February 21, 1931, p. 613.)

« A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

That the doctor has made great strides ahead in the conception of his duties to the public was demonstrated conspicuously in an obscure breakfast meeting between representatives of the State Medical Association and the Minnesota Editorial Association on Tuesday, May 5. Steadily the obstacles in the minds and traditions of the profession are being removed so that the doctor, and not the free lecturer with an almanac to sell, may be the real teacher of public health and public welfare.

In witness of the new trend, five Minnesota physicians—representatives of the association—and five representatives of the Minnesota Editorial Association inaugurated what is likely to be a new era in Minnesota in the relations between these two groups.

Technically this meeting was designed merely to pave the way for the appointment by both associations of a standing advisory board to be composed of five editors and five physicians with the widest possible representation in the state, whose duty it will be to meet regularly and iron out the little differences and misunderstandings and misconceptions that have kept the two looking at each other suspiciously at arm's length everywhere, and to bring about coöperation to effect acceptable methods of legitimate public health education.

This breakfast episode, almost buried in the avalanche of committee meetings and the scientific program of the May meeting, is likely to have a far reaching effect in Minnesota.

It is one of the proud distinctions of organized medicine in Minnesota that it has made unprecedented advances in the coöperation with and direction of public health agencies in the state.

This meeting has laid the foundation for an equally brilliant, sound, and effective coöperation in another direction. Lack of intelligent understanding of each other's problems has been the cause of bitterness and distrust between both professions immemorially. While such a state of things might, and generally did, formerly exist without seriously interfering with the doctor's or editor's function, it is now a thing of the past.

The business of bringing into being everywhere in the big cities and the small towns a happy relationship between editor and doctor is no stupendous task if the friendliness and moderation and understanding displayed at the preliminary meeting is a reliable sign.

Mr. Lou Benshoof of Detroit Lakes Tribune, Jefferson Jones of the Minneapolis Journal, Mr. Roy Dunlap of the St. Paul Pioneer Press and Dispatch, Mr. A. E. McGowan, executive secretary of the association, were among the representatives of the Minnesota Editorial Association present at the meeting.

The resolution passed at this conference follows:

"Be it resolved that this conference favors the forming of an advisory board of public relations between the Minnesota State Medical Association and the Minnesota Editorial Association of five representatives from each association. It is the sense of this conference that the representatives of the two associations be selected so as to have representation of the state at large."

This resolution was read and passed at the House of Delegates meeting later in the day and was similarly approved by the Editorial Association in session later in the same week.

A meeting late in the summer of the two committees is contemplated though their personnel is not yet complete.

OF GENERAL INTEREST

Dr. M. H. Whalen is practicing in Duluth, with offices at 4701 E. Superior Street.

Dr. C. M. Rudie has moved from Mazeppa to Kenyon, Minnesota.

Dr. W. A. Gleason, who completed his interneship at St. Luke's Hospital in Duluth a year ago, is practicing at Osceola, Wisconsin.

Dr. H. F. Bayard, formerly of the Mayo Clinic, Rochester, Minnesota, has opened offices at 420 Medical Arts Building, Minneapolis, and is specializing in proctology.

Dr. J. V. Carlson, following the completion of his interneship at St. Luke's Hospital, Duluth, a year ago, may be addressed at 2 North Garfield Street, Alhambra, California.

Dr. Oliver Heimdal recently completed his surgical fellowship at the Mayo Clinic, Rochester, and has opened an office at 402 Graham Building, Aurora, Illinois.

Dr. H. Longstreet Taylor, St. Paul, was elected to the Executive Committee of the National Tuberculosis Association at its annual convention held in Syracuse in May.

Physicians are reminded of the necessity of filling out a transfer form with the Collector of Internal Revenue when changing their location in order to maintain their registration under the Harrison Narcotic law.

Dr. W. B. Rydell, after serving his interneship at St. Luke's Hospital in Duluth, has entered practice at Buffalo, Minnesota. Dr. R. A. Trombley is now located at Emmons, Minnesota; Dr. H. H. Green at Austin, and Dr. Karl Emanuel at Iron Mountain, Michigan.

Members of the Women's Auxiliary who are planning to attend the National Auxiliary meeting at Philadelphia may obtain hotel accommodations through Mrs. Frederick S. Baldi, Room 304, Chamber of Commerce Building, 1129 Walnut Street, Philadelphia.

Dr. Franklin R. Wright appeared before the Camp Release District Society in Olivia on April 27. Instead of reading a paper he answered questions for three hours on Venereal and Genito-urinary Diseases. Questions were furnished by members of the Society.

Dr. Harry A. Daniels has recently completed a Fellowship in Internal Medicine at the Mayo Clinic, Rochester. He is limiting his practice to Internal Medicine, in Chicago, and is associated with Drs. Arnold H. Kegel and Frederick W. Schacht. Dr. Daniels was formerly in practice, at Eveleth, Minnesota, from 1922 until 1927.

Members of the Minnesota State Medical Association, especially those who attended the Minneapolis Assembly of the Inter-State Postgraduate Medical Association of North America, will be interested to know that the published Proceedings of that Assembly are now available and may be procured through the office of the Executive Secretary, Dr. Edwin Henes, Jr., 759 North Milwaukee Street, Milwaukee, Wisconsin.

The Medical Alumni Association of the University of Minnesota will erect a suitable monument for the unmarked grave of Dr. Perry H. Millard, the first Dean of the Medical School. Dr. Millard was largely responsible for the organization and early development of the school and was also the author of most of the medical laws by which we are governed. Medical Alumni may send contributions for the fund to Dr. Donald Daniel, Treasurer, at 1453 Medical Arts Building, Minneapolis.

Dr. W. A. Fisher, who is president of the Chicago Eye, Ear, Nose and Throat College, and who is noted for his introduction of the Smith Indian method for cataract extraction, came to Minneapolis May 6 to see Dr. C. N. Spratt's method for the extraction of cataract. A luncheon was given at the Minneapolis Club by Drs. C. N. Spratt and Archa Wilcox, and was attended by thirty of the prominent ophthalmologists. Dr. Samuel Higgins, who read a paper before the Minnesota Academy of Ophthalmology and Otolaryngology, witnessed a demonstration of Dr. Spratt's method of operation later in the week.

Dr. Hyman S. Lippman has been appointed director of the St. Paul Child Guidance Clinic and has taken over the post made vacant by the death of Dr. M. L. Stiffler. Dr. Lippman received his medical degree at the University of Minnesota in 1919 and specialized in pediatrics. He was on the staff of the habit training clinics under the auspices of the Minneapolis Infant Welfare Society from 1923 to 1927 and then spent two years on the staff of the Institute for Child Guidance in New York City. Dr. Lippman comes to St. Paul from Vienna, where he spent eighteen months in the study of adult and child psychology.

Dr. Richard E. Scammon, during the present academic year dean of medical and biological sciences at the University of Chicago, will return to the University of Minnesota next fall to fill the newly created post of dean of medical sciences. Dr. Scammon was professor of anatomy at the University of Minnesota prior to his going to Chicago in the fall of 1930. He has done much research work in comparative embryology and the growth and physical development of children, and is the author of several books on these subjects. In his new position he will be especially charged with the stimulation of research in medical science and related fields that requires the coöperation of the various colleges of the University.

COOK COUNTY HOSPITAL CLINICS

The annual post-graduate summer clinics conducted by Cook County Hospital, Chicago, under the auspices of the Chicago Medical Society, will be held June 22 to July 3. Dr. N. S. Davis, III, Secretary of the Society, reports that the clinics will be organized to give the practicing physicians in attendance practical instruction in the line of medicine and surgery. In fact, the two weeks will cover an intensive post-graduate study of the latest modern medical developments. Cook County Hospital probably offers a better opportunity for such study than any other hospital in the country.

Medical men from all sections of the United States and Canada are expected to attend these clinics which will be held from 8:00 A. M. to 5:00 P. M. each day, and the lectures that will be given three nights each week at eight o'clock. Physicians desiring further information about this post-graduate course should write the Secretary of the Chicago Medical Society, 185 North Wabash Avenue, Chicago.

MISCELLANEOUS

TRAINING FOR MEDICAL RESERVE OFFICERS AT THE MAYO FOUNDATION, ROCHESTER, MINNESOTA, AND WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, ST. LOUIS, MISSOURI

Through the courtesy of the authorities at the Mayo Foundation, Rochester, Minnesota, and the Washington University School of Medicine, St. Louis, Missouri, arrangements have been made whereby there will be given a period of fourteen days inactive duty training for Medical Reserve Officers without expense to the government. The dates of this training are as follows:

Mayo Foundation, Rochester, Minnesota, October 18-November 1.

Washington University School of Medicine, St. Louis, Missouri, November 8-November 22.

These courses present to Medical Reserve Officers a two-fold advantage: (a) Medico-military instruction; (b) Refresher course in professional subjects. The courses are so arranged that a Reserve Officer can devote his morning hours in any of the clinics or other purely medical professional studies he desires. The afternoon and evening hours will be taken up entirely with medico-military subjects. The custom of taking annual study courses has become so general among medical men that argument about its advantage is unnecessary. Furthermore, patriotic motives of a Reserve Officer in the interest of National Defense and his advancement in the military service have created a desire for periodic instruction in Medical Department Reserve matters. These two great medical centers have provided the ways and means whereby the two-fold purpose can be accomplished.

For the past two years inactive duty training to Medical Department Reserve Officers has been given during the fall months at the Mayo Foundation, Rochester, Minnesota, for a period of two weeks. The authorities of the Mayo Foundation provided the facilities, including instructors, offices, class rooms, etc., necessary to carry on the school. All expenses incurred, except the salaries of the members of the Regular Army, were borne by the Foundation. The Washington University School of Medicine has offered the same facilities, including clinical instruction in the various branches of medical practice and the clinical material, laboratories, museums, libraries of the school and lecture rooms without charge. A group of faculty members have volunteered to give instruction and hold clinics during the period of training.

At our first inactive duty training camp at the Mayo Foundation most of the students were Fellows of the Mayo Foundation, or otherwise connected with the Mayo Clinic. A few were physicians from other parts of the Corps Area, who profited by having the mornings free to devote to observation of the work at the Clinic. The attendance at this school for the first year was thirty-three (33). The following fall, 1930, another two weeks period of training was provided, with the same facilities as in the previous year, by the Mayo Foundation. Fifty-one (51) Reserve Officers received instruction during this training period. The school was originally established because of the difficulty in granting leave to the Reserve Officers at the Mayo Clinic for camp training in July because of the fact that this was the rush season at the Clinic. After conducting two of these camps the authorities at the Mayo Clinic summarized the advantages as follows:

a. A Reserve Officer in convenient periods of the year receives stimulating personal instruction along military lines.

b. It provides preparation for taking examination for the next higher grade.

c. It affords a Medical Officer the satisfaction of knowing he is better fitted for his present rank.

d. It provides for the combination of military training with a professional observation course at the medical center.

Great interest was shown in these two courses and many of those who attended emphasized the importance of such a course on account of the dual purpose offered a busy doctor, namely, training for the duties required of a Military surgeon and the opportunity for a refresher course in any specialty of medicine.

All applications for the course of training at the Mayo Foundation should be made to the Director of the Mayo Fundation through the Surgeon, Seventh Corps Area, and applications to take the course at Washington University School of Medicine should be sent to the Dean of Washington University School of Medicine through the Surgeon, Seventh Corps Area.

ADDING INSULT TO INJURY—BRAZEN EFFRONTERY OF THE AMERICAN TOBACCO COMPANY

Has your quiet evening enjoyment of the radio ever been disturbed by the raucous voice of the Lucky Strike announcer, informing the world that "Luckies are kind to the throat"? Has your blood *boiled* because of the heat engendered by his slanderous pronouncement that "20,679 physicians have stated Luckies to be less irritating" to the throat and less likely than other brands of cigarettes to induce coughing? Have your respect for science and love of truth suffered under his deceitful, tricky, distorting use of the language of science to bolster up an alleged scientific treatment of tobacco to improve its quality?

Quite aside from its offensive character, as viewed by physicians, the Lucky Strike advertising matter is about the worst that the American business craze for blatant, impudent, false, not-quite-provable-lying advertisements has yet produced. Let us analyze the speech that is repeatedly broadcast and the wording of ads now appearing in daily papers like the New York Times and magazines like the Forum; publications that ought to be but are not above engaging in the spread of such deceptive and misleading material.

The statement that 20,000 physicians signed cigarette testimonials may be true, though we doubt it. But, if it be true that so large a number of educated men could be induced to "sign a blank check," the fact must not be overlooked that in this instance the signatures were secured by methods which smack of fraud. While we feel ashamed of the fact that so many of our brothers proved themselves "easy suckers," the advertiser who procures testimonials through deceptive procedures has little to be proud of or boast about.

The statement—"It's toasted! Everyone knows that heat purifies and so toasting removes harmful irritants that cause throat irritation and coughing"—is made to appear as evidence of a scientific fact, but is, in reality, nothing but a jumble of words covering three alleged facts which have no true relationship to one another. For instance: "Everyone knows that heat purifies." We might retort that everyone knows also that heat *destroys*. What reason is there to suppose that heating will purify tobacco? We may assume the answer would be that heat is destructive only when applied in an intense form, and that purification attends upon the use of heat in moderate degree. Very good, but if by "purifies" it is meant to imply that microörganisms—disease-producing germs—are destroyed, we respectfully submit that a considerable degree of heat is required for that purpose, repeatedly applied in the case of spore-bearing germs, and that the heat of *toasting is not sufficient* to accomplish the purpose. A very simple experiment can be tried in the kitchen. Would any bacteriologist testify that toasting a slice of bread will destroy pathogenic germs on or in that bread, and thus purify it? We think not. Which disposes of that alleged fact.

Perhaps germs were not meant; we admit they were not mentioned, but we are unable to think of any other form of purification that could have been alluded to in that statement. The second alleged fact (or is it a deduction from the previously alleged fact?) is that "toasting removes harmful irritants." What irritants? Bacterial, as referred to above, or chemical? If the claim refers to chemical substances, pray tell us what chemical irritant can be removed from tobacco by the simple process of "toasting." We have some knowledge of chemistry but need help to solve that problem.

Thirdly, it is stated that toasting removes "irritants that cause throat irritation and coughing." Again, may we ask what is the name and nature of these irritants (characterization of a single one will satisfy our personal curiosity) that irritate the throat and induce coughing? If the claim can be sustained, that smoking tobacco or cigarettes of any kind produces of itself a specific irritation of the throat and a characteristic cough, there are several thousand specialists in affections of the throat who will welcome proof thereof, and who will be particularly glad to be enlightened as to the specific nature of the irritant.

But that is not all—we had almost forgotten the greatest claim of all: "Everyone knows that sunshine mellows—that's why toasting includes the use of the Ultra-violet Ray." Ah! What a lucky strike! Ultra-violet rays (why not vitamins)—fads of the day—must be worked in to aid the old-fashioned toasting. "Sunshine mellows"—perhaps, but who has proved that it is the ultra-violet end of the spectrum that produces the mellowing effect, on fruit for instance, and what constitutes the mellowing of tobacco? Like Hashimura Toga, "We ask to know."

What, then, does our analysis show? In plain English, it shows that the bombastic radio announcement and the printed advertisements referred to are a tissue of falsehoods strung together in such an impressive manner as to deceive the simple-minded listener and reader, and the advertiser doubtless hopes that repetition of deceptive statements will give them the effect of truthfulness. And the medical profession is made to appear as endorsing all this tommy-rot.

What can we do about it? Shall we, 100,000 or more physicians, supinely submit to these nightly radio and daily newspaper insults of the Lucky Strike manufacturers, or shall we make some effort to suppress such advertising and to protect the public and ourselves against misleading, deceptive and slanderous broadcasting, whether by radio or printing?

You may recall that the old slogan of this same company—Reach for a Lucky Instead of a Sweet—was quickly withdrawn when the sugar trust aided the candy-makers in a demand for suppression.

—*Journal of the Medical Society of New Jersey,* February, 1931.

Do not forget the date of the American Medical Association meeting which takes place June 8 to 12, inclusive.

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question*—About 1927, a young wife came to me complaining of "rheumatic" pains in the back and shoulders. She is very short, fleshy, weighs 165 pounds although only 5 feet 3 inches in height, very athletic, being able, when well, to swim a mile without effort. She has a history of having had "grippe" every year as long as she can remember. She has chronically infected tonsils which are adherent. No other diseases. Father has diabetes in a rather mild form. Mother died of carcinoma of breast. Brother and sister living. One brother died of tumor of pineal gland. The patient had her first baby in January, 1928, and her second in March, 1930. Since 1927 her "rheumatism" has progressed. Tonsils were removed in March, 1927. In 1928 she began to have pains in her knee joints and fingers. The only time she has not been bothered with joint pains was during the last pregnancy. So far the case seems perfectly clear but the peculiar part of it is that she has these pains in periodic attacks beginning regularly every ten days apart, at which time the knee joint swells and fills with fluid. The swelling is so severe that she can not walk except with great difficulty, and then in two or three days the swelling and pain are gone and she can walk as well as ever. There is usually slight tenderness for a day or two following. I have on two occasions drawn out an ounce or more of fluid from the knee joint and tried to grow the organism at the laboratory but without success. The fluid is clear, amber, and contains many leukocytes but we can not find any bacteria. In 1927 or 1928 a consultant saw her and thought she had a streptococcus viridans type of arthritis deformans and gave her large doses of sodium cacodylate intravenously without very much improvement. Salicylates had no effect. In the earlier part of her disease, the leukocyte count was from 12,000 to 20,000. It is never found below 11,000. The information I desire is this: Does a streptococcus type of arthritis cause periodic recurrence of pain without deforming effects? Have you any suggestions as to treatment? I am now using triple typhoid injections, starting with 12½ million and increasing the dose.

   Answer—This type of patient has been recently studied at the University of Minnesota by Drs. Macnider Wetherby and B. J. Clawson. They find in one-half of their cases a positive blood culture of streptococci, usualy streptococcus viridans. After studying this group of patients with pain, tenderness, swelling, and disability of the joints with or without deformity, they came to the conclusion that many of them were atypical variations of the same process. Animals can be immunized against the organism by intravenous injections of streptococcic antigen. This causes the titre to rise without increasing the sensitivity as evidenced by skin tests. On this basis, they have treated a considerable number of patients and note that improvement follows in about 75 per cent. They believe that their treatment is not an atypical foreign protein reaction but think it is a more or less specific response. This type of infection, undoubtedly, has an allergic factor and the periodic symptoms of pain, tenderness, and swelling are in accord with such a belief. At the present time, Drs. Clawson and Wetherby are continuing their studies but are not yet ready to release the antigen for general use. I have asked them to get in touch with you in regard to the matter. It is our impression that your patient has a streptococcus viridans type of arthritis without deformity. Removal of foci of infection may or may not have any influence on the course of the disease as reinfection may take place from foci in the joints. You might continue to use triple typhoid vaccine or boiled milk although this treatment is not uniformly successful.

2. *Question*—When is the best time to operate on a spina bifida?

   Answer—As a rule, if an operation can be done, it should be deferred until the child is able to stand the shock. Operations are usually attempted before the child starts to walk and possible injury results from bumping against things. In the interval, the parents will be able to see that a certain amount of progress (if paralysis is present) is taking place so that the operation is not blamed for any continuation of the process. If you would restate the case, we would perhaps be able to give you more definite information but, as a general rule, operation is deferred until just before the patient begins to get about with a possibility of injury.

3. *Question*—The patient is a single nurse, 21 years of age. She has complained of feeling tired for the past six months, lost eighteen pounds in weight, and runs a temperature of 99.5 to 100.5 but this is inconstant. No cough. She has had frequent colds the last winter with rather severe chest pains. No history of tuberculosis in her immediate family but one grandmother had tuberculosis. On physical examination, the chest does not show anything striking. Urine negative. Appetite good. No night sweats. An X-ray of chest revealed clear apices but moderate thickening of hilus. In addition, there is a slight increase in bronchial markings, especially in the lower lobes. The size of the hilus may be slightly exaggerated because the patient is slightly turned.

   Answer—The absence of parenchymal findings is against the X-ray diagnosis of tuberculosis. In the absence of sputum, it is impossible to rule out tubercle bacilli which would be diagnostic. A positive tuberculin reaction would indicate tuberculous infection but might not have anything to do with the present condition. A negative reac-

(Continued on Page 570)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: Dr. William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of June will be as follows:

June 3—Ringworm of Feet.
June 10—Toxemia of Pregnancy.
June 17—Erysipelas.
June 24—X-ray and Radium in Treatment of Cancer.

THE RECENT STATE MEETING

A registration of more than nine hundred physicians, from all over the Northwest, with isolated representations from great distances, marked the successful Seventy-Eighth Annual Meeting of the Minnesota State Medical Association which occupied Tuesday and Wednesday, May 5 and 6, at the Nicollet Hotel in Minneapolis.

A day and a half of lectures at the hotel and a half day of clinics at the University hospitals constituted the scientific program of this meeting with George Gray Ward, Jr., of Cornell University, New York, and Drew Luten of Washington University, St. Louis, Mo., among the distinguished visiting speakers.

Officers elected at this meeting, to take office in January, 1932, were: M. S. Henderson, Rochester, president; B. S. Adams, Hibbing, first vice president; A. E. Hedback, Minneapolis, second vice president; E. A. Meyerding, St. Paul, secretary, and W. H. Condit, Minneapolis, treasurer. Herbert Giffen, Rochester, was elected councilor to succeed Dr. Henderson. Other councilors re-elected at the expiration of their three year terms included: H. M. Workman, Tracy; F. J. Savage, Saint Paul, and W. W. Will, Bertha.

One of the outstanding undertakings of the House of Delegates was the consideration of the report of the committee appointed last year to study the future policies of the Association. This committee presented its report for discussion before the Council, and both sessions of the House of Delegates, through its chairman, O. E. Locken, and was accepted with some additions and changes by that body.

Formation of another new committee to be called a Committee to Study the Problem of Medical Economics also marked the House of Delegates meeting at its final Wednesday session. In all, more than twenty committee reports were received and passed upon by the body.

The presentation of a watch to Dr. H. M. Workman, Tracy, in recognition of long and faithful service as president of the Council, was a surprise feature of the banquet on Tuesday evening. A crowd that seriously taxed the capacity of the hotel to accommodate it, attended. C. H. Mayo, Rochester, acted as toastmaster, the banquet program including, besides the presentation address of A. S. Hamilton, Minneapolis, the presidential address of L. Sogge, Windom, a talk by Mrs. James Blake, Hopkins, president of the Women's Auxiliary to the Minnesota State Medical Association, and Congressman W. I. Nolan of Minneapolis on "My Friend the Doctor."

St. Paul was selected as the place of the next meeting, the date to be decided later by the Council.

AMERICAN PROCTOLOGIC SOCIETY

The thirty-second annual meeting of the American Proctologic Society will be held in Philadelphia, Sunday, Monday, and Tuesday, June 7, 8, and 9, 1931. The scientific sessions will be on June 7 and 8, and all members of state medical societies are cordially invited to attend.

PAN AMERICAN MEDICAL ASSOCIATION

The third congress of the Pan American Medical Association will be held in Mexico City, July 26-31, 1931, under the auspices of the government of the Republic of Mexico.

The purpose of the Association is to promote a more intimate understanding between the medical men of North and South America. An effort is being made to further medical contacts between English, Spanish, French and Portuguese speaking physicians of Pan America, and a cordial invitation is extended to all physicians interested.

This meeting affords an opportunity for physicians in this country to pay a visit to our sister republic; a trip which has become more and more popular in the last few years.

Further information may be obtained by addressing Dr. Francisco de P. Miranda, Executive Secretary of the Organization Committee, Departmento de Salubridad Publica, Mexico City, Mexico.

STEARNS-BENTON COUNTY SOCIETY

The annual meeting of the Stearns-Benton County Medical Society was held April 25, 1931, at the U. S. Veterans Hospital, St. Cloud. The Society was entertained at supper as guests of the hospital staff.

The following officers were elected to serve until January, 1933, since it was the sense of the meeting to amend the Constitution to end the fiscal year in December rather than in April as at present: Dr. William Friesleben, Sauk Rapids, president; Dr. Julian F. Du Bois, Sauk Centre, vice president; Dr. Wm. H. Rumpf, Jr., Saint Cloud, secretary; Dr. Francis J. Schatz, Saint Cloud, treasurer.

Censors: Dr. George E. Sherwood, Kimball, three years; Dr. Richard N. Jones, St. Cloud, two years; Dr. William L. Freeman, St. Cloud, one year.

Delegate: Dr. John P. McDowell; alternate, Dr. John N. Libert.

Dr. R. H. Sweetman of Sauk Centre was unanimously elected an honorary member of the Society, having completed the requirements.

William H. Rumpf, Secretary.

MINNESOTA RADIOLOGICAL SOCIETY

The annual meeting of the Minnesota Radiological Society was held in Minneapolis May 4, 1931. The following program was presented:

ROUND TABLE DISCUSSIONS

1. Therapeutic X-ray Dosage and Measurement Problems. Conducted by
   Dr. E. T. Leddy, Rochester.
2. Gastric Ulcer
   Conducted by
   Dr. J. Richards Aurelius, St. Paul.
3. Traumatic Spine Lesions
   Conducted by
   Dr. Gage Clement, Duluth.
4. The Chest in Children
   Conducted by
   Dr. Malcolm B. Hanson, Minneapolis.

INFORMAL DINNER

Address: The Intervertebral Disc. Dr. Emil S. Geist, Minneapolis.

Pathologic and Roentgenologic Study of Joint Diseases, Dr. R. K. Ghormley, Rochester.

The present officers were re-elected for the coming year as follows:

Dr. B. R. Kirklin, Rochester, president; Dr. Gage Clement, Duluth, vice president; Dr. Leo G. Rigler, Minneapolis, secretary-treasurer.

Leo G. Rigler, M.D., *Secretary-Treasurer.*

RED RIVER VALLEY SOCIETY

The Spring meeting of the Red River Valley Medical Society was held in Crookston, Minnesota, April 14, 1931. The following program was presented:

1. Diathermy in Acute Pulmonary Diseases.
   Dr. G. S. Wattam, Warren, Minnesota.
2. The Office Treatment of Diseases of the Cervix, with Special Reference to the Cautery.
   Dr. J. R. Manley, Duluth, Minnesota.
3. Advances in the Diagnosis of Heart Disease.
   Dr. O. E. Locken, Crookston, Minn.

C. L. Oppegaard, *Secretary-Treasurer.*

UPPER MISSISSIPPI MEDICAL SOCIETY

A meeting of the Upper Mississippi Medical Society was held at Wadena, April 25, 1931. Papers were given by John F. Madden, of St. Paul, on "Diagnosis and Treatment of Common Skin Diseases," and by W. Ray Shannon, of St. Paul, on "Infantile Tetany."

F. W. Van Valkenburg, *Secretary.*

INTER-STATE POST GRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

The next annual meeting of the Inter-State Post Graduate Medical Association will be held at Milwaukee, October 19 to 23, 1931.

The names of those who will take part in the scientific program have been announced and the coming meeting promises to be as comprehensive as the recent meetings have been.

For further information, the secretary, Dr. Edwin Henes, Jr., Milwaukee, may be addressed.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. S. S. Hesselgrave, St. Paul
Chairman Press and Publicity—Mrs. E. A. Meyerding, St. Paul
Editor—Mrs. A. A. Passer, Olivia

A meeting of the State Executive Board of the Women's Auxiliary was held at the Nicollet Hotel, Minneapolis, Tuesday, May 5, following a luncheon in the main dining room. Dr. Kathleen Jordan of Granite Falls spoke on "Tuberculosis in Children—the Value of the Mantoux Test."

The annual business meeting of the Women's Auxiliary was conducted in the Hennepin County Medical Society Rooms of the Medical Arts Building, Wednesday, May 6, at 10:00 a. m. Dr. L. Sogge of Windom addressed the assembly. Other speakers included: Dr. W. A. Coventry of Duluth on "The Doctor Looks at the Auxiliary"; Dr. C. E. Rudolph of Minneapolis on "The Cost of Medical Care." Annual reports were given by officers, committees, and county auxiliary presidents.

Mrs. Edward Schons, St. Paul, was elected president of the Women's Auxiliary for 1932. Mrs. James Blake, Hopkins, who was elected last year, will serve as president this year. Other officers elected were: Mrs. R. N. Jones, St. Cloud, first vice president; Mrs. H. M. Blegen, Warren, second vice president; Mrs. J. W. Stuhr, Stillwater, third vice president; Mrs. E. M. Hammes, St. Paul, secretary; Mrs. W. A. Coventry, Duluth, treasurer; and Mrs. M. L. Mayland, Faribault, auditor. Article 3, Section 3, of the By-Laws, was amended to read: "Terms of office shall begin following the National Convention of the Women's Auxiliary to the American Medical Association."

Mrs. S. S. Hesselgrave will attend the National Convention of the A. M. A. Auxiliary as state president, and Mrs. James Blake will attend as a national officer, being second vice president of the Women's Auxiliary to the A. M. A. Minnesota is entitled to nine delegates to the national convention.

Mrs. Martin Nordland, Robbinsdale, was appointed treasurer during the absence of Mrs. W. A. Coventry, who will tour Europe during the summer.

The reports of committees were interesting and showed the great interest throughout the state in the various social, philanthropic and educational activities sponsored by the auxiliary and approved by the doctors.

The luncheon on Wednesday, May 6, was served at the Woman's Club of Minneapolis. Mrs. Martin Nordland, president of the Hennepin County Auxiliary, presided. Speakers included Dr. William A. O'Brien and Mr. H. A. Bellows. A musical program was given by the Thursday Musical Ensemble, under the direction of Mrs. C. Jay Willcox.

The Women's Auxiliary coöperated with the Minnesota Public Health Association in the High School radio broadcasts by offering a Silver Cup for the best radio talk. The cup was awarded to Eugene Lambert of Cloquet and honorable mention to Arnold Lawson of Owatonna, by Mrs. Hesselgrave, state president.

The annual banquet of the State Medical Association and Women's Auxiliary was held at the Nicollet Hotel, Minneapolis, Tuesday evening, May 5. Dr. Charles H. Mayo of Rochester was toastmaster. The address of welcome was given by Dr. S. H. Baxter, president of the Hennepin County Medical Society. Speakers included Dr. L. Sogge, president of the State Association, Mrs. James Blake, president-elect of the Women's Auxiliary, Dr. A. S. Hamilton of Minneapolis, and the Honorable W. I. Nolan of Minneapolis.

May 6, 1931

PRESIDENT'S REPORT

Ninth Annual Meeting—Women's Auxiliary to the Minnesota State Medical Association

Our brief year has come to a close and the report of our activities will soon be filed away with the record of other years. It has been a privilege to serve as president of the State Auxiliary because of the loyal support given me by the Executive Board in carrying out our program and I most sincerely thank the officers, the Committees and the County Auxiliary presidents for their kind and courteous coöperation.

The following have fully earned and receive our highest commendation:

The Organization Chairman, Mrs. James Blake, who has sown seed for new auxiliaries in every corner of the State, of which the harvest of new members has been bountiful. We take the greatest pleasure in welcoming these 210 new members of our State Auxiliary and in wishing them success in their work and happiness in the new friendships to be formed.

Mrs. Hugh Tunstead and her Legislative Committee for the discretion and vigilance exercised during the past legislature.

Our Public Relations Chairman, Mrs. Davis, for a tentative program that our advisors have prepared for auxiliaries who wish to study the most recent developments in medicine.

Our Press and Publicity Committee in the capable hands of Mrs. E. A. Meyerding, with the valued coöperation of the office of the Minnesota State Medical Association in this field.

Mrs. A. A. Passer, our Editor, who has filled many columns with colorful Auxiliary news. MINNESOTA MEDICINE for the valuable space given, and its Editor, Dr. Carl Drake, for his editorial "The Women's Auxiliary," published in the December number, which has been copied by eastern journals.

Mrs. Carl Larsen, Finance and Budget Chairman, Mrs. Murdoch, *Hygeia* Chairman, Mrs. C. C. Chatterton and Mrs. Peterson, Hospitality Chairmen, and their committees.

Our parliamentarian, Mrs. W. J. Byrnes, who for a number of years has held before us the "Rules of Order," has kept a gracious if rigid count of our parliamentary errors. We respect her opinions, adhere to her decisions and we appreciate her devotion.

Our advisors, Drs. E. A. Meyerding, C. B. Wright, and George Earl, who have kept our course free from entanglements. We urge all county auxiliaries to request the appointment of advisors from their Medical Society. Drs. Sogge and Meyerding for addressing our meetings, and Drs. Critchfield and Hensel for their radio talks.

Our secretaries, Mrs. Boleyn and Mrs. Schons, and our treasurer, Mrs. Coventry, and the auditor, Mrs. Catlin, all deserve unstinted paise.

In November, I had the pleasure of attending the National Executive Board meeting in Chicago, where I met the national officers and presidents of other states. From this meeting I brought back a national viewpoint in Auxiliary work and added enthusiasm for the Women's Auxiliary.

In February I gave a brief talk on "Uses of the Auxiliary" at a Symposium on Public Relations; in March a five minute talk during a Health Radio broadcast over WCCO during Federation hour.

I have been the guest of the following County Auxiliaries: Washington, Wright, Rice, St. Louis, Hennepin and Ramsey. I thank them for their kind hospitality and assure them that I enjoyed their meetings, their reports and their social activities and their courtesy in inviting me.

It was my good fortune to be called upon to coöperate with the Organization Committee in the forming of new auxiliaries, and through the kindness of Mrs. Schons and Mrs. Hewson, who offered their cars, we travelled many hundreds of miles on our quest for new groups during our intensive campaign. We thank Mrs. Braasch of Rochester and Mrs. Lommen of Austin for their kindness to us during our visit in their homes.

I sent out many form letters and wrote hundreds of personal letters that have brought the county auxiliaries in closer contact with the state and national organizations. Our revised Constitution has been printed and distributed. The Treasurer's files have been completed and the Treasurer's receipt forms have been used by all the local treasurers. We thank these patient workers and our Treasurer for her efficient handling of this innovation that has been a revelation as to accuracy of record.

I am sure that the entire State Auxiliary wishes to join me in conveying our sincerest thanks to the capable committees who have worked to make our present stay in Minneapolis so pleasant, and to present our homage to the distinguished president of the Hennepin County Auxiliary and to her entire Auxiliary we say, "Well done, dear friends and neighbors."

In parting I would offer the following recommendations: Have advisors appointed from your Medical Society. Notify the president of a change in officers immediately after their election to office. Collect your dues by January first each year. Adopt a program of activities that help the doctor. Exercise eternal vigilance over the health programs offered by your women's organizations. Do not neglect the social side—it is most important that pleasant relations be established among doctors' wives. Give your new officers the staunch support you have given me.

This is the end of a happy year. To all my coworkers I bid not "adieu" but "Au revoir," and again I thank you.

Respectfully submitted,
(Mrs. S. S.) Marie E. Hesselgrave, *President*

PARK REGION AUXILIARY

The Women's Auxiliary met at the home of Mrs. W. W. Drought of Fergus Falls, Wednesday, April 8. At the business session it was suggested that the Auxiliary obtain a speaker from the State Medical Society to speak to the public, in May. A committee was appointed to arrange for the midsummer meeting.

RICE COUNTY AUXILIARY

A meeting of the Rice County Women's Auxiliary was held in Northfield, April 16, at the home of Mrs. Neil S. Dungay, with Mrs. Orin P. Thorson as assisting hostess. A short business meeting was held and the remainder of the afternoon was spent in sewing for the Red Cross. Refreshments were served at four-thirty, followed by a social half hour.

RESEARCH FOR A NON-HABIT-FORMING SUBSTITUTE FOR MORPHINE

The Committee on Drug Addiction of the National Research Council announces a large collaborative research in alkaloidal chemistry by chemists and pharmacologists of this country. Apparently the present object of the Committee is to prepare a non-habit-forming substitute for morphine that will yet possess the desirable action of morphine. (Jour. A. M. A., March 14, 1931, p. 863.)

CONSULTATION BUREAU

(Continued from Page 566)

tion would aid more in the diagnosis but would not be absolute. Physicians who limit their work to diseases of the chest find cases of this sort rather common. The differential diagnosis is between a non-tuberculous respiratory infection and tuberculosis. Information available to date would seem to indicate the possibility of the former but does not absolutely rule out the latter. She should be watched from this standpoint and other sources of weight, loss, fever, and fatigue kept in mind.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of April 8, 1931

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 8, 1931. Dinner was served at 7 P. M. and the meeting was called to order at 8 P. M. by the President, Dr. J. S. Gilfillan. There were forty-seven members and two visitors present.

Minutes of the March meeting were read and approved.

Dr. A. S. Hamilton read the following Memorial to Dr. W. A. Jones:

Dr. William A. Jones died at the Northwestern Hospital January 15, 1931, at the age of 71 years, of which forty-eight were spent in Minneapolis. He was a very active man and in the course of his long life had an important part in many activities. In addition to his private practice, he was for many years a teacher in the School of Medicine at the University; he was on the staff of various hospitals, including a heavy service at the Minneapolis City Hospital for years; he was for thirty years editor of the *Journal-Lancet,* and an active member of the State Board of Health for twelve years. In addition to these, he had time to cultivate an extensive acquaintance among medical men, to give many public addresses and to write many articles. If, as Osler put it, the principal centers of a medical life in a city are the medical school, the hospital, the medical library, the medical society and the medical journal, then Dr. Jones was certainly prominent in every field of medical activity.

His parents were of Scotch and Welsh ancestry. Both his paternal and maternal grandfathers served in the Revolutionary War. His father came to St. Peter in 1854 and his mother in 1858 and both suffered the privations of pioneer life and the horrors of the Indian outbreak of 1862. Dr. Jones was born in 1859.

He attended grade school and high school in St. Peter and when only fourteen years old entered his father's drug store as a clerk and there gained a thorough and practical knowledge of drugs. He later studied medicine at the University of the City of New York and was graduated in 1881 and directly afterward became assistant physician at the State Hospital for the Insane at St. Peter. In 1883 he came to Minneapolis and practised general medicine until 1886, when, after his marriage to Annie R. Johnson of Denver, he went to Europe and took special work in nervous and mental diseases at Berlin and Vienna. On his return to Minneapolis, he began special practice and soon attained a prominent position in the field of nervous and mental diseases, which he retained to his death.

In his lifetime he held many prominent positions, both local and national. At different periods, he served on the staff of the Northwestern, the Minneapolis City, the Asbury, the St. Mary's, the Swedish and the Norwegian Hospitals. In 1913, he founded the South Side

Sanitarium and maintained it as a private hospital almost to the time of his death.

He was a member of the Hennepin County and the Minnesota State Medical Societies and of the Minnesota Academy of Medicine, and had been president of all three. He was also a member of the American Psychiatric Association, and of the American Neurological Society, and was a charter member of the Central Neuropsychiatric Association and of the Minnesota Neurological Society and was president of the latter. He was an active member of the American Medical Association, was Chief of the Section of Nervous and Mental Diseases in 1914, and in 1928-29 served as Vice-president of the Association.

By the very nature of his calling, a physician is more or less a public character. Throughout his professional life, Dr. Jones was deeply interested in the preservation of health and the prevention of disease. On January 1, 1906, he was appointed a member of the State Board of Health and served as such to December 31, 1918, being president from January 10, 1911, to December 31, 1918. During his term of service in the course of some tempestuous activities, he was a loyal supporter of Dr. Bracken as secretary, and particularly so during certain difficulties which arose in the legislative session of 1917 and which resulted in failure to reappoint Dr. Jones. The character of his work on the Board is indicated by the statement of one of its officials that he was a masterful chairman, and, with his sense of humor, his absolutely frank attitude toward all questions and his prompt action, he was the most accomplished and the most efficient member the Board ever had.

In 1890 he was appointed by Governor Nelson a member of the Board of Trustees of the State Hospitals for the Insane and held this position until 1894.

He was Editor of the *Northwestern Lancet* and of the *Journal-Lancet* from 1901 to 1931 and no one who knew him well could doubt his deep interest in and genuine affection for this publication. The Journal catered to the special medical activities and interests of a limited geographic area and Dr. Jones' editorials were its most striking feature. Many medical men have been heard to say that they subscribed to the *Journal-Lancet* for W. A.'s editorials. To most men, the preparation of a series of editorials every two weeks would be a real task. To Dr. Jones it was a labor of love, quickly performed. Without a note at his command, the editorial was dictated as the ideas flowed from his mind and if it had any further corrections they were made at the hands of the stenographer or the publisher. That he had the confidence of the medical profession in his undertaking is shown by the following list of contributors to the first number: Drs. Frank Allport, James H. Dunn, James E. Moore, H. L. Staples, R. O. Beard, and A. T. Mann.

As a clinical teacher of neurology and psychiatry he was always a favorite among the students and out of a very ordinary patient he could always make an interesting case. Though never a profound clinical investigator, he could quickly see the outstanding clinical features of his case, and his diagnosis, whether in the clinic or in private practice, though often of the snapshot type, was generally correct. In 1889 he was made instructor in Nervous and Mental Diseases at the Medical School of the University, became professor in 1900 and served as such to his retirement in 1919. During the Great War he again took up the duties of a teacher in the Medical School in the absence of the regular staff, and also served as a member of a medical advisory board during the war.

Dr. Jones had a large collection of books, both general and medical, and in the later years of his life in particular, when he was often confined to his room for short periods, the writer always found him with stacks of books about his bed. Throughout his life reading was his greatest hobby. His medical library he left to the Hennepin County Medical Society, to which he had contributed liberally throughout his life.

As a practitioner in functional nervous and mental diseases, Dr. Jones was more than ordinarily successful. Possessed of a dominating personality, he impressed his ideas on patients to a very unusual degree and with his characetristic optimism and abounding vitality he inspired them with new hope and courage. Though brusque at times and very blunt, he was always forceful in his relations with patients who accepted his advice and followed his directions as best they could.

Always very fond of music, for many years he had in his own home a pipe organ which he played with much pleasure and he used to tell how he contributed to his scant income, in the early period of his profession, through his musical ability.

All his life he was a hard worker and he had few vacations—the last in 1921—and such as he had were purely urban. He cared nothing for fishing, hunting, or motoring, and his ideal vaaction consisted in a trip to New York, where he spent his days on the top story of a hotel reading and his evenings at the theater. He had a high intelligence and a ready wit and repartee, and was always popular at medical meetings, where he often presided, easily and ably. To the very last he carried with him his unquenchable courage and cheerfulness and his refusal to accept the rôle of an invalid.

He is survived by his wife and a sister, Mrs. J. W. Bell.

Signed: Arthur S. Hamilton,
H. B. Sweetser,
E. M. Hammes,
Committee.

The scientific program was as follows:

Dr. E. M. Hammes (St. Paul) reported a case of Progressive Muscular Atrophy with Initial Involvement of the Upper Spinous Muscles gradually extending to the Scapulo-Humeral Group, with Respiratory Phenomena. The patient was presented.

The patient was a male, 59 years of age, married, a resident of St. Paul. His family history is negative. His personal history shows that he had dropsy in 1893 and an appendectomy thirty years ago. He neither smokes nor drinks. His wife and two children are living and well. She has had no miscarriages.

He stated that for many years his throat has been unduly sensitive to dust and irritating substances. A year ago he had an attack of bronchitis which was relieved somewhat by steam inhalations. Since that time he has had an occasional feeling of tightness in his throat but no obstruction. He paid very little attention to this because it occurred seldom and lasted only a few minutes at a time.

On February 26, 1931, he had a double herniotomy under spinal anesthesia. He did not notice anything until about four days afterward, when he began to have trouble in breathing. There was a great deal of inspiratory weakness but no obstruction. He stated that it felt as if his chest were one great big empty space and that he could not fill it with air. There was no change in his voice, and swallowing was normal.

The inspiratory difficulty has become more constant of late. At first it was intermittent and worse at night. Now it is almost constant and least noticeable when he is lying on his back. When he gets up in the morning and bends over it is most troublesome.

His general physical condition is somewhat below normal. His weight is less than it was a year ago by about 8 pounds. His appetite is fair, his bowels regular, and he sleeps well. He has had arthritic pains in his shoulders and hips for the past few years.

X-rays of his chest show that the diaphragm extends high up bilaterally. His arms feel weak, especially in the shoulders. This has been present for the past year. He has had a feeling of weakness and soreness in both gluteal muscles for the past nine months. In the past two years he has developed some scoliosis and his shoulder blades stick out more than formerly.

The physical examination shows that he has many teeth missing and there is slight evidence of pyorrhea. There is fairly marked winging of the scapulæ.

The neurological examination shows that the pupils, cranial nerves, and fundi are normal. The upper extremities show bilateral atrophy of the shoulder girdle, upper arm, chest and spinous muscles, especially in the upper dorsal region. There is marked coarse fibrillary and fascicular tremors over all these muscles and some slight fibrillary tremors of the gluteal muscles. The muscle strength is impaired and expansion of the chest is limited. The deep reflexes in both upper extremities are present but somewhat reduced. Both lower extremities show normal knee and ankle jerks. There is no ankle clonus or Babinski, and no evidence of atrophy. The muscles in the gluteal region seem to have a little less pronounced tone than those of the other lower musculature. The abdominal and cremasteric reflexes are normal. Sensation is normal throughout. He has quite a marked kypho-scoliosis. The Romberg is negative.

His hemoglobin is 85 per cent; blood pressure 148 systolic, 96 diastolic. Urine is normal.

Dr. Horace Newhart (Minneapolis) read his Inaugural Thesis entitled, "Recent Advances in Deafness Prevention," and demonstrated the use of the audiometer.

Dr. W. F. Braasch (Rochester) read a paper, and showed numerous X-ray films, on "Intravenous Urography."

DISCUSSION

Dr. E. L. Gardner (Minneapolis): What precautions, if any, do you take against reaction in this procedure?

Dr. Braasch: I have never seen any systemic reaction in any of these patients when using skiodan.

Dr. Gilbert Thomas (Minneapolis) (by invitation): I wish to thank the president for the privilege of listening to Dr. Braasch's paper as a guest of Dr. Foley and the Academy of Medicine.

In discussing Dr. Braasch's paper and the conclusions which he has drawn, one must remember he has had a wide experience, and has examined thousands of pyelograms. I was a student with him when he was compiling data for his book on urography, and I know the immense amount of material he reviewed before publishing the book. The same has been true in his experience with skiodan and intravenous urography.

As Dr. Braasch has told you, obstructions in the ureter or any condition which prevents the normal outflow of urine from the kidneys and through the ureters will make a very good urogram after intravenous injection of skiodan. Intravenous urography will orient shadows supposed to be stones in the urinary tract. The size and position of the kidney, together with the identification of masses in the abdomen in relation to the kidney, may be made with skiodan, or intravenous urography.

This drug, which contains a large amount of iodin, is contraindicated when the combined renal function is low. Definite harm may occur in the presence of marked renal insufficiency if it is used.

The technic of intravenous injection should be carefully learned by any one who proposes to use intravenous urography. Much harm and discomfort to the patient may occur if care is not used in the preparation of the water and the solution which is finally introduced into the vein.

When iodin-containing drugs were first used we believed they were contraindicated in the study of tuberculosis of the kidney. However, after chemical analyses by the Mayo Foundation, we learned that Skiodan is eliminated in just the same form as it is given, so that no free iodin is found in the blood stream.

Intravenous urography is particularly helpful when it is impossible to introduce a cystoscope into the bladder. Sometimes this occurs in children. In severe cystitis, particularly tuberculosis, this method of examination is useful, as well as in traumatic conditions of the ureter or bladder. Many times intravenous urography is the only method which can be used for making diagnoses in the types of cases just mentioned.

Intravenous urography, then, is just another method of accurate diagnosis, and should be used as such. I think this point should be emphasized so that physicians and surgeons who have not heretofore interpreted urograms and who have not taken careful histories and obtained other data that is necessary should not use the intravenous urogram as the only criterion for making positive diagnoses.

Dr. S. M. White (Minneapolis): I would like to ask Dr. Braasch how long before the uroselectan or skiodan is given do you cease giving water; in other words, how many hours before the intravenous injection is water interdicted?

Dr. S. E. Sweitzer (Minneapolis): I would like to ask Dr. Braasch if he has seen any cutaneous eruptions from the use of this iodin preparation. Practically every drug that has been administered will occasionally give an eruption on the skin. I have seen some articles that stated uroselectan had caused some skin eruption.

Dr. F. E. B. Foley (St. Paul): Dr. Braasch's opinion and appraisal of this new method are extremely valuable. Most of us have had insufficient experience with it to permit forming so valuable an opinion.

I was gratified to find him so guarded in praising intravenous urography. When I first read Swick's paper, I thought I would have to give up urology in favor of something else, for it appeared that intravenous urography was going to eliminate the cystoscopist. Experience has not borne this out. Those of us who are using it regularly are becoming more and more aware of its limitations. It appears now that the most significant accomplishment of intravenous urography is going to be the easy fereting out of a greater number of obscure urologic conditions that will then be submitted to the more comprehensive study possible by cystoscopy, and the more accurate interpretation permitted by a direct pyelogram.

I endorse enthusiastically all of what Dr. Braasch said, with one exception. Unless I misunderstood him, it was said that in the case of an obscure abdominal condition intravenous urography may be used to exclude the upper urinary tract as a cause. That has not been my experience. I would say that positive findings by intravenous urography may be of extreme value in showing the kidney or ureter to be the cause, but negative findings cannot be relied upon. With the rather poor pyelograms so obtained, it is not possible, for example, to exclude kidney tumor, renal tuberculosis, or slight obstructions.

Dr. Braasch brought out a point which I would like to emphasize. By comparison with direct pyeloureterograms, these are poor pictures in point of interpretive value. He showed from the same case both an intravenous pyelogram and one made by the direct method. It was very obvious, when viewed together, that the intravenous pyelogram suffered tremendously by comparison. When it comes to refinements of interpretation, the very best pyelogram we can get is none too good. Intravenous pyelograms usually fail to show the deformities of early neoplasm, early tuberculosis, small cysts, slight obstructions and changes in the ureter. Accordingly, the negative findings from them have little value.

When it comes to grosser things, such as localization of stone and recognition of obstructions causing well-marked dilatation, the method is of considerable value. With the exception of these two conditions its value is extremely limited in the general run of upper urinary tract conditions.

Dr. Braasch covered the whole field so thoroughly that it is difficult to discuss the subject without repeating the things he has already said. However, there is one more point I would like to repeat and enlarge upon. A use of intravenous urography which appeals very strongly to me is its employment in cases of bladder-neck obstruction. The information we get from phthalein tests and blood chemistry determinations tells us the functional power of the kidney at that particular time. A low phthalein excretion and nitrogen retention may be due either to mere temporary functional block or to extensive and permanent anatomic change. By phthalein tests and blood chemistry determinations we learn nothing of the obstruction and dilatation of pelves and ureters that occur with long-standing vesical neck obstruction. These changes are particularly well disclosed by intravenous urography. Accordingly the method permits us to more accurately appraise the surgical risk, to know the ability to recover function and to judge in advance how long a period of drainage will be required to attain the maximal degree of functional improvement before the operation is undertaken.

Dr. Braasch (in closing): In preparing the patient we simply request that as little fluid as possible be taken for twelve hours prior to urography.

When we used a fifteen per cent solution of sodium iodide for intravenous urography we observed a number of patients with severe skin eruptions caused by iodine absorption. Since using iodine organically combined, as in uroselectan and skiodan, I have not observed any skin reaction.

Dr. Thomas is quite right in statements regarding the difficulties of technic involved. The question may well be asked, who is best equipped to make the intravenous urogram? At the meeting of the American Roentgen Ray Society, which I attended last fall, it was very interesting to find that there were a number of roentgenologists who announced that they were equipped to do intravenous urography. There should be no competition between the roentgenologist and the urologist; they should combine their resources. This is also true of the urologist and the general practitioner. The technical difficulties in the hands of a man accustomed to intravenous manipulation are not many. The greatest difficulty may be found in interpretation.

Although intravenous urography may be of much value in general diagnosis in many ways, it will be of greatest use in that it offers a simple method of recognizing hydronephrosis, which is so frequently overlooked. It will also be of great assistance in the recognition of stone in the kidney and ureter. I do not use the cystoscope now in many of these cases, for, with the evidence that the intravenous urogram offers, there is no object in cystoscopy. It will be a valuable factor in preventing the general man from overlooking lesions of the urinary tract in differential diagnosis.

The meeting adjourned.

R. T. LaVake, M.D., *Secretary.*

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of April 2, 1931

The regular monthly meeting of the Minneapolis Surgical Society was held at the University Hospital on the evening of April 2, 1931. The members of the Society were guests of the Superintendent and Surgical Staff of the Hospital at a 6:30 dinner in the Nurses' Dining Room, after which they adjourned to the Todd Ampitheater for the scientific program, which was a clinical meeting presented by various members of the Surgical Staff. Dr. O. H. Wangensteen, Chief of the Department of Surgery, presided. There were thirty-one members of the Surgical Society present.

The Scientific Program was as follows:

Dr. H. P. Ritchie (St. Paul) said that Dr. Waldron and he had been trying to develop a clinic on plastic surgery to deal with the reconstruction of the various congenital deformities and those that had resulted from traumatism from various causes. A great part of the work still deals with the deformities of the face, generally called "harelip and cleft palate." The first question usually asked is the cause of these deformities. Dr. Ritchie said that they are now looked upon simply as embryonal defects which showed failure of union of the several embryonal processes and that he had collected cases from his own files and from the literature to show that they are only a part of a large group of process failures, not only in the lip but of the nose, the face, and the lower lip and jaw as well.

Case 1.—In this case the right and left maxillary embryonal processes have failed to unite with the median embryonal process which makes up the nose, prolabium and pre-maxilla. The difference between this case and the normal baby is that in the latter all the divisions have come together, while here they are all apart.

Case 2.—The pre-maxilla has been replaced in relation to the maxillary processes and the lip has been done by bringing the muscles underneath the skin and in front of the mucous membrane of the prolabium, the mucous membrane of which has been incorporated in the vermilion border of the lip. The body of the lip is coming out pretty well, but there is still trouble with the nostril. Dr. Ritchie said that the nostrils usually look alike in these cases although they may not be what the baby is entitled to.

Case 3.—This is a single harelip and cleft palate—the most frequent type of case with these various combinations. The alveolar process is not yet closed. This lip was done elsewhere and evidently was repaired without due effort to close the cleft in the bone; and, as can be seen, the nostril is very wide and flaring.

Case 4.—This is the same combination as Case 3, but the bone is in position and the nostril and lip, while not perfect, is a great improvement over the one just shown. Dr. Ritchie said that the technical details of the repair of the lip are the most controversial questions in surgery, but surgeons are gradually coming to the conclusion that the steps involve the consideration of two principles, one dealing with the active tissues of the body of the lip and one with the inactive tissues about the nostril.

Case 5.—This baby was operated on last Monday and the lip was repaired on the theory that the opportunity for future growth and development of this lip required the exact approximation of the muscle elements of the lip; so it was built puckered up, as you can see. The reason for this is that every lip has the physiological function of whistling and that this is the end-result of the action of all the muscle elements and, if these babies can be given the power to do this, presumably the other odd function of these elements of the lip will naturally follow.

Dr. Ritchie then showed a group of cases for the use of skin grafts and the repair of various contractures. One group, and the one most important from the standpoint of function, include the contractures about the joints. In the consideration of these cases there is a great difference between involvement of the flexor and extensor surfaces. In the former, of course, the deeper tissues must be definitely considered because there are more essential structures placed there than in the latter.

Case 6.—This boy was burned over a year ago, and Dr. Ritchie said it has taken practically all the time since to cover this enormous area, which, as could be seen, involved the right arm, the axillary space, the shoulder and on to the chest. The consideration of these enormous granulating surfaces is one of the very great problems in this field, not only from the standpoint of the patient but from the economic side of the case. The arm was put on an airplane splint and was extended, but even with all this preliminary care he has contractures at both folds of the axilla and a very extreme contracture at the elbow joint. The only thing which had been done for the patient so far was to skin-graft the shoulder, on which a full thickness skin graft was used. This was placed upon the granulating surface with a complete "take" and with a smooth area which approximates the normal skin. The rest of the area was grafted by the small deep graft suggested by Dr. Davis of Baltimore. Dr. Ritchie said this has no comparison with the full thickness graft in the nature of the cosmetic result, but, as could be seen, it has developed a definite epithelial covering. He said the next step in this case was to release the contractures at the axilla and also the release of the contracture at the elbow joint. In the latter there is greater opportunity than anywhere else for having involvement of the deeper structures; normally the elbow joint has the thinnest epithelial covering and it is not an uncommon thing to find that the contracture is due to deep-set adhesions about the joint; and sometimes it is necessary to elongate the biceps tendon, which, over such a long period as in this case, may be very definitely contracted. Hence, on the flexor surface of the elbow joint and the popliteal space, operations may develop into major procedures. Dr. Ritchie said as yet he had not studied this particular case sufficiently to be in a position to say what is necessary to be done to this joint.

Case 7.—This girl's arm was bound down to her side by wide scar bands over the thorax and she also had contractures at the axilla. A large contracture at the neck was taken care of and beautifully done by Dr. Waldron on the plan of the Z-plasty. By extension, the scar tissues are raised up into a band above the surrounding tissues. The band is then bisected and two flaps made. Then, by cross incision, flaps are made which, by fitting the flap on one side into the raw surface of the other, permit of increasing by at least fifty per cent the distance between the two ends of the contractures. Z-plasty was also done on the thorax. In this instance six flaps were cut and placed.

Case 8.—This case falls in another interesting group of the congenital deformities involving the consideration of moles, angiomata and tumors. This boy had an enormous mole involving the left eyebrow, one-half of the forehead, and extending upward beyond the hair margin. Dr. Ritchie said that to remove this mole and substitute a full thickness skin graft would exceed the possibilities of tissue transference; and while the full thickness skin graft is a wonderful adjunct it has some limitations as regards size. In this case the mole was diminished in size by successful partial excisions, and, in so doing, consideration was taken of the elasticity of the surrounding skin. On three occasions a full inch was removed along the middle of the mole, the tissues were undermined and the wound sutured. By so doing, it was possible to diminish the size of the mole to a point where it was possible to substitute a full thickness graft for the diseased tissue. The position on the forehead is one of the most favorable sites for a successful result because the bone of the forehead presents resistance to pressure of the graft and permits of perfect fixation, which, in Dr. Ritchie's opinion, is essential to success.

Case 9.—This case is one of contracture on the dorsum of the hand. The fingers were thrown back to a point impossible to illustrate at this time. The scars were removed and a full thickness skin graft substituted.

Dr. Ritchie said this was the third case of the full thickness skin graft which he had presented this evening—the one on the shoulder on a granulating surface, the one on the forehead, and this one on the hand; and in each one of these cases the graft presented the appearance of normal skin.

Case 10.—Dr. Ritchie said there had been several cases of lye burns about the mouth. This young lady had a resulting contracture to a point where it was impossible to put a spoon in the mouth. The plan of repair of this case was to break this circular band in two places. Dr. Ritchie said he had found that a single incision into a contracture would result in a condition that is even worse than the original, but if the band is broken in two or three places the tissues in between the incisions tend to re-vascularize and, even though there is a scar, the tissue will take on the aspect of normal skin. In this case the first step was to break this circular band, which was done at each angle of the mouth. Then the scar tissue was rearranged on the principle of the Z-plasty, with material improvement in the case. The patient then returned for a second operation and the bands of scar tissue were removed by the cut-and-suture method, with the result, as could be seen, of a full open mouth. The patient still had a band on the inside of the mouth which Dr. Ritchie said could be sectioned and a Thiersch graft placed on a mould. He said they had found that a Thiersch graft placed in the mouth will take on the aspect of mucous membrane although, of course, it will not secrete.

DISCUSSION

Dr. Willard White (Minneapolis) asked if this would also apply to the mucous membrane of the urethra.

Dr. Ritchie said he had just completed reconstructing a male urethra with a flap from the scrotum.

Dr. White asked if a Thiersch graft or a thin layer of epithelium were applied to the urethra it would take on the function of the mucous membrane.

Dr. Ritchie replied that he really did not know but he presumed it would if it could be fixed in position. A Thiersch graft can be used for the enlargement and lining of the nostril, but with the urethra he thought the problem would be to fix it in position until healing took place.

Dr. Carl W. Waldron (Minneapolis) presented the following patients:

Case 1.—Bilateral Resection of a Portion of the Mandible for Protrusion. This young man had a very marked protrusion of the mandible and had but two teeth that came in contact. A bilateral resection was done. There is now satisfactory occlusion and the patient has a good strong jaw. The wires are still in place but the twisted ends have been removed.

Case 2.—Restoration of the Cheek by a Skin Graft Lined Neck Flap. Stage 1. This patient has a pocket in the neck and one can see the skin graft lining of the pocket. The outline of the neck flap could also be seen. This condition is postoperative from carcinoma of the cheek. About six months ago the patient was unable to open his mouth because of an extra-articular ankylosis of the jaw due to scarring. This had been relieved by dividing the scars and skin grafting to prevent recurrence.

Case 3.—Restoration of the Cheek by a Skin Graft Lined Neck Flap. In this patient a flap from the neck was used to restore a large defect in the face. A double surface skin graft was first buried in the neck, as in Case 2. The cheek defect was acceptably closed by the flap, but it had been reopened along its upper border to give better access to an area of recurrence of the carcinoma.

Case 4.—Total Restoration of the Nose by the Forehead Flap. Stage 1. This flap as outlined has been raised and replaced on the skull on two occasions in order to make it better able to maintain its vitality with a considerably reduced arterial supply and venous return. The alæ could be seen on the flap. The extremity of the flap would be used to form the columella and line the vestibule.

Dr. William T. Peyton (University Hospital) presented a follow-up study of "Cases of Cancer of the Rectum Treated at the University Hospital Since 1924." Seventy-seven patients were found to have been treated from the beginning of 1924 to the present time. The present condition of every case had been determined. Twenty-two of the patients are now living. Lantern slides were shown giving the date of admission of each patient and his subsequent course. Lasting freedom from recurrence is most apt to follow the combined abdomino-perineal operation, and seventeen patients were operated upon by this method (Coffey operation performed). Four of these are still living: one 7 years, one 5 years, one 4 years, and one 3 years. However, the mortality by this procedure was high; in the 17 operations of this type there were 7 postoperative deaths. This operative mortality can probably be reduced in two ways: (1) Selection of one of the other types of combined abdomino-perineal operation instead of the Coffey procedure; (2) The use of spinal anesthesia instead of general anesthesia. W. E. Miles had reported a mortality of 36.2 per cent under general anesthesia, which was reduced to 9.4 per cent under spinal. Cases should be carefully selected for this extensive operative procedure and only good surgical risk patients accepted; the others should have some other lesser procedure.

Dr. Peyton then demonstrated several patients from the Tumor Clinic.

Case 1.—Miss M. M., aged 62, had a lesion which began at the medial corner of her left eye in 1919. It was at first treated with salves, and later in the same year some X-ray therapy was given. The lesion improved but did not entirely heal. It remained rather quiescent until October, 1928, when it took on rapid growth. She came to the University Hospital for treatment in April, 1930. (The condition at the time of her admission to the clinic was demonstrated by lantern slides.) X-ray at the time of admission showed some involvement of the left maxillary sinus and the floor of the left orbit and left frontal sinus. She was treated with deep X-ray therapy during 1930 on April 30, May 5, May 23, July 18, October 11, and December 29. She was given narcotics for pain but the pain has been subsiding and at present she is not taking as much.

Case 2.—Mrs. B. A lump appeared in the left breast April, 1930, and was excised locally one month later. It almost immediately recurred and she had a radical mastectomy in December, 1930. A few weeks later an enlarged left supraclavicular node appeared and she was referred to the University Hospital; 792 mc. hrs. of radium implants were inserted into this and it has disappeared.

Case 3.—Mr. L., aged 65, noticed in April, 1929, a roughening of the left cheek on the mucosal surface. In January, 1930, a small lump developed at the site of this roughening. In April he consulted a physician and it was excised. In July, 1930, he had radium elsewhere. In November, 1930, he was first admitted to the University Hospital with a local recurrence at the site of removal of the primary lesion. This recurrence was about 3 × 4 cm. in diameter and was attached to the mandible with fixation of the jaw so that he could not open his mouth. The skin in this region was ulcerated, as was also the mucous membrane. There were no palpable nodes. X-ray showed involvement of the mandible. Biopsy showed squamous cell carcinoma, grade 4. On November 29, 1930, excision of the mandible was done and this was followed by deep X-ray therapy. He has had no recurrence since this removal.

Case 4.—Mr. O., age 48, first noticed a slight soreness of the right cheek in 1921 while chewing tobacco. The surface was rough. In the summer of 1925 it began to grow larger, at which time it was cauterized by a doctor. Following this it persisted and grew, and became painful. He came to the University Hospital for treatment in October, 1926. Examination showed an irregular, rough, ulcerated lesion, 2 × 1 cm., inside the right cheek. There were palpable submaxillary nodes in the right side. Biopsy showed squamous cell carcinoma. Two thousand mc. hrs. of radium was implanted in the lesion in November, 1926. In January, 1927, he had excision of the glands in his neck. Biopsy of these glands showed no malignancy. In November, 1927, the local recurrence was treated with 3 mc. of radium. In June, 1929, leukoplakia was destroyed with the surgical endotherm. In October, 1929, he had a local recurrence which was excised with the surgical endotherm and the mandible was cauterized, as it seemed to be involved. In February, 1930, he developed erysipelas. In May, 1930, the entire right side of the mandible sequestrated and was removed, leaving a large defect in the right cheek. In November, 1930, a recurrence was treated with 1,000 mc. hrs. of radium. On February 24, 1931, he was re-admitted to the hospital and a recurrent lesion was excised, the lateral wall of the antrum being removed at this time.

Case 5.—Mr. O. W., aged 62, noticed in December, 1929, a feeling of fullness in the rectum and diarrhea. He saw a doctor in October, 1930, and was referred to the University Hospital for treatment. Examination at that time was as follows: mentally confused, marked pallor of the skin; blood examination showed hemoglobin 75 per cent and 3,480,000 red blood cells. An operable carcinoma of the rectum was found about 10 cm. from the anal opening; it was movable and about 5 cm. in diameter, limited to the anterior wall of the rectum. Biopsy showed adenocarcinoma, grade 3. It was decided not to attempt radical excision because the patient's general condition was so poor. A colostomy was performed. Three thousand five hundred mc. hrs. of radium in the form of implants and high voltage X-ray therapy was given. On January 23 there was no definite evidence of recurrence but some induration and he was given 1,000 mc. hrs. of radium in the form of implants. There is no definite evidence of carcinoma at the present time.

Case 6.—Mrs. A. D., aged 69, first noticed this lesion n 1918. She had no treatment for two years, then had plasters in 1920. This was followed by radium therapy. She came to this hospital in September, 1928, at which time there was a large flat ulcer of the right frontal region with involvement of the upper eyelid. The lids had been sutured. Biopsy showed basal cell carcinoma. She had been given deep X-ray therapy in December, 1928, but this did not heal the lesion probably because the cartilage was involved. In January, 1929, she had more treatment but the lesion still did not heal and in February she was advised to come to the hospital for endotherm excision. In March, 1929, she had more X-ray therapy. She then disappeared until October, 1929, in the meantime going to a "healer." In October, 1929, she was re-admitted to the hospital and a recurrence was then removed with the endotherm knife. In December, 1929, there was a persistence of the carcinoma which was removed with the surgical endotherm. She had no further recurrence until April, 1930, when areas were removed which were found to be mixed squamous and basal cell cercinoma. In May, 1930, further recurrence was removed with the surgical endotherm. In March, 1931, a biopsy was taken which again showed a recurrence. This was treated with 1,500 mc. hrs. of radium implants. The patient is now in an almost hopeless condition.

Case 7.—Male, aged 58, had irritation and soreness of the tongue in July, 1929. In October, 1929, he saw a doctor and was referred here for treatment. Examination at that time showed a red, ulcerated lesion in the posterior part of the left side of the tongue, 3 cm. in diameter. There was an enlarged gland in the upper part of the left side of the neck. In November, 1929, the patient received 800 mc. hrs. of radium implants to the lesion. This was followed by deep X-ray therapy. In February, 1930, a block dissection of the left side of the neck was done. Squamous cell carcinoma was found in the glands of the neck. The patient had a local recurrence in February, 1930, which was treated with 950 mc. hrs. of radium implants. There was local recurrence in August, 1930, which was treated with 800 mc. hrs. of radium implants. He had another local recurrence in January, 1931, which was treated with 2,000 mc. hrs. of radium implants.

Dr. Wilhelm K. Stenstrom (University Hospital) discussed malignancies especially amenable to X-ray and radium treatment. Dr. Stenstrom presented two cases as follows:

Case 1.—This man came in April, 1928, with a lesion on his hand. It was diagnosed squamous cell epithelioma in the Dermatology Clinic, and he was referred to the X-ray Therapy Department for treatment. A very heavy dose of X-rays was given and a second similar treatment was given two months later. If surgery had been used in this case it is doubtful if he would have had the full use of his hand.

Case 2.—This man came in June, 1930, with a lesion on the nose extending down on both sides. The ulceration was raised about 0.5 cm. and measured 3 cm. in diameter. It was diagnosed squamous cell epithelioma. The lesion was treated with gold radon implants into the raised edges and X-rays to the whole lesion. It has been healed since August, 1930.

Dr. Stenstrom said he wanted to call attention to another type of cancer best taken care of with radiation alone and that is cancer of the cervix. In this group radiation alone usually accomplishes more than surgery alone, but it is necessary to consider the various types. There are certain types that may be handled better by surgery and that is where the pathologist comes in to help the surgeon. Most groups of malignancies should be differentiated as to the grade of malignancy. As a rule the more malignant and fast-growing tumors do better with radiation; the slow-growing type are best taken care of with surgery.

DISCUSSION

Dr. Ivar Sivertsen asked how soon after radiation is surgery advised.

Dr. Stenstrom said that surgery usually was used first when combining the two, and if surgery is used after radiation one should give the radiation an opportunity to work—perhaps 10 to 14 days. He added that at the University Hospital surgery is not used in cancer of the cervix.

Dr. J. F. Corbett asked if any form of radiation was used in cancer of the breast.

Dr. Stenstrom replied that in certain cases radium is implanted after operation and X-ray therapy is used as a prophylactic postoperative treatment for all patients operated for cancer of the breast at the University Hospital.

Dr. Corbett asked if it was used before operation in these cases at the University Hospital.

Dr. Stenstrom replied that it was not.

Dr. Wallace H. Cole (St. Paul) demonstrated the "Use of Skeletal Traction in Conditions Other than Fractures."

In order to show how skeletal traction either by the use of Steinman pins or Kirchner's wire can be used in conditions other than fractures, numerous lantern slides were shown which demonstrated the value of this procedure in the following conditions:

1. Congenital dislocation of the hip in older children, as a preliminary to open reduction or to shelving.
2. Pathological dislocation of the hip, in order to overcome the shortening before stabilization or reduction.
3. Coxa vara, after osteotomy.
4. Shortening of leg due to infantile paralysis.
5. Congenital shortening of the leg.
6. Marked angular deformities of the lower extremities, either acquired or congenital.

The results in all these conditions, in selected cases, are apparently far better than could be obtained by less radical means. The pins and wire do not cause any irritation or discomfort if applied and taken care of properly. Although special apparatus is needed for the leg lengthenings, all the other procedures can be accomplished with the use of only the simple Thomas splint.

Dr. **Edward T. Evans** (Minneapolis) reported the following cases:

Case 1.—Arthroplasty of the Hip. The patient was a male, 44 years of age. Preservation of the integrity of the great trochanter during the operative procedure and disproportion between head and acetabulum were stressed.

Case 2.—A young man 21 years of age who, at the age of 11, developed a tumor of the knee which proved to be myxofibrosarcoma. Mid-thigh amputation was performed. (Specimen shown.)

Dr. Evans mentioned a case which he had operated on only that morning removing a large cystic hydroma of the knee joint. (Specimen shown.)

DISCUSSION

Dr. **Wangensteen** stated that these knee joint tumors are very interesting and that one other such case had come under his observation. The other case had been seen at the University Hospital several years ago and was thought at that time to be a hemangioma. Later the case had come under Dr. Colvin's care at the Ancker Hospital in St. Paul. Dr. Noble worked the tumor up from a pathological standpoint and found it to be a lipofibrosarcoma. They do not metastasize but are potentially malignant in that they tend to recur locally after removal. The only satisfactory treatment, therefore, is amputation.

Dr. Wangensteen felt that the injection of air after withdrawal of fluid from the pouch, in Dr. Evans' second case, was a unique manner of establishing the presence of continuity with the knee joint and was a significant principle in radiography of cysts and bursæ that has a wide range of usefulness and a method that had occasionally been used at the University Hospital in the recognition of such conditions over a five-year period.

Dr. **A. R. Colvin** (St. Paul) said he might discuss the second case from the point of view of difficulty in diagnosis. He had had a man at Ancker Hospital, 60 years of age, who had a tumor about three times the size of this one, and an interesting point about that was that he had been here some years before with an injury. The condition was diagnosed as a hematoma. He left the hospital and wandered around and came to St. Paul six years later. Dr. Colvin said they had at Ancker Hospital at the same time a man with a large swelling on the axilla and around the shoulder, with a diagnosis of carcinoma.

Their first case turned out to be a myxosarcoma and had an amputation done. Their second case was a large hematoma. In the first case the biopsy had been taken from a hemorrhagic area of the tumor, hence the confusion; and in their second case the biopsy was taken from an organizing area of the hematoma, hence the histological confusion. Amputation through the thigh was done in their first case and there is still no evidence of metastases in spite of the fact that it had existed such a long time; evidently it was not a very malignant tumor.

Dr. **Wangensteen** called attention to the fact that these knee joint tumors had been studied by Professor Wegelin, Director of the Pathological Institute in Berne, and that he found some of them to exhibit xanthomatous tissue.

Dr. **N. Logan Leven** (University Hospital) discussed the "Uses of the Implantation Method of Skin Grafting."

Dr. Leven demonstrated a method of skin grafting first described in 1920 by Welhelm Braun in Berlin and introduced into this country by Dr. Wangensteen in the fall of 1928 (reported by Dr. Wangensteen in the March, 1930, issue of Surgery, Gynecology and Obstetrics).

The method consists in the implantation of small pieces of skin, 2 × 4 mm. in size, directly into the granulations. The skin is usually obtained from the anterior aspect of the thigh. After the usual skin sterilization by iodin followed by a half-strength solution of sodium thiosulphate in 70 per cent alcohol, the area from which the skin is to be removed is anesthetized by infiltration with 1 per cent novocaine solution. The surface to be implanted is painted with a 2 per cent aqueous solution of mercurochrome. No anesthesia of the granulating surface is usually necessary. (Light ethylene anesthesia may be used if there is much pain.) Drawing the skin taut between two dinner plate knives or tongue blades, a Thiersch graft is cut with a straight edge razor or with a razor blade held in a hemostat. The size of the graft removed will of course depend upon the extent of the area to be implanted. With a fine sharp scissors the graft is cut into small pieces, about 2 × 4 mm. in size; these are placed on a sterile board covered by a towel. With a Kelly forceps an ordinary small straight round sewing needle is grasped "end on" so that the blunt end of the needle is free. The small implants which have been cut are then impaled with the blunt end of the needle and pushed obliquely into the granulation tissue until they disappear from sight. The needle is withdrawn, using a tissue forceps or another needle to retain the graft in place.

The grafts are implanted about 1 cm. apart, covering the entire granulation surface in this manner. By this method a large defect can be covered with a small amount of skin.

For a postoperative dressing vaseline gauze may be used; however, if the wound is infected and discharging pus, the ordinary Dakin's dressing is used, there being no danger of washing off the implants. About one week later small whitish areas appear at the sites of implantation. These small islands of epithelium grow rapidly and cover over the granulating surface.

The question arises why epithelial cysts are never found in this type of graft, since in the case of traumatic or experimental implantation of epidermis in the normal skin the well-known Reverdin's traumatic epidermic cysts develop. These implants are laid in a soft mass of granulation tissue and grow without injury or resistance along small clefts to the surface of the granulations. In the normal skin, on the other hand, the epidermis is interposed between the rigid fibers of the reticular part of the skin and tend to grow along the relatively large lymph spaces rather than in any other direction.

Case 1.—This patient had a disarticulation at the hip on February 11, 1931, for an extensive tuberculous infection of the head and neck of the femur and of the ilium with sinus formation. A rather long medial flap was used to partially close the defect. On the fourth day, however, a large part of this had to be sacrificed on account of a gas gangrene infection. On March 4, after granulations had formed, the stump was implanted by this method and, despite constant purulent drainage from the ilium, it is healing nicely.

Case 2.—This patient had a large defect following removal of the right scapula for a large mixed-cell sarcoma. This was implanted and healed nicely.

Case 3.—This patient on admission to the hospital last fall presented a large ulcer on the lateral aspect of the left foot following X-ray therapy. On four occasions this was widely excised by cautery and by sharp dissection in an effort to obtain a granulating base. Granulations at all times appeared indolent, unhealthy, and covered by a pellicle of fibrin. These granulations were implanted, using thicker implants than usual.

Braun has suggested, in using this method in sites where there will be traction or pressure, that the graft should be cut to one-half or two-thirds the skin thickness.

Dr. Leven showed a lantern slide exhibiting a large pressure sore in which the method had been employed. The patient was suffering from a paraplegia secondary to metastasis to the dorsal spine from a carcinoma of the cervix uteri, and developed a large decubitus ulcer over the sacrum. This was implanted and, despite pressure and incontinence of urine and feces, was practically healed at the time of her death seven weeks later.

Dr. Leven stated that the only condition requisite in using this procedure is that granulation tissue must be present in the wound. The method is effective in the presence of infection and does not require healthy granulation for growth. He stated that this type of graft has an absolute indication in those cases in which other types of graft would fail—in osteomyelitic cavities, chronic empyema cavities, and decubitus ulcers with undermining of the skin. The epithelial surface resulting from this type of graft is similar to that of wounds in which all the epithelium has been derived from the periphery of the wound, the implants not preserving their identity.

Since the fall of 1928 this method of skin grafting has been used in about 100 cases of all types—decubitus and trophic ulcers, varicose ulcers, osteomyelitic and chronic empyema cavities, amputation stumps, operative and traumatic defects, and burns. In 80 per cent of these cases the results have been very satisfactory. A further factor that commends the use of this method is that it may be used in ambulatory patients in the outpatient department.

DISCUSSION

Dr. Wangensteen stated that this technic of skin grafting was employed quite frequently at the University Hospital and that undoubtedly some cases had been grafted by this method in which others methods would have served the purpose just as well or better. In obtaining an epithelial covering over excavated defects such as osteomyelitic cavities, pressure sores, or deep empyema wounds, the method has no equal.

Dr. C. Donald Creevy (University Hospital) discussed "The Punch Operation for Prostatic Obstruction."

He reviewed briefly the history of attempts to relieve prostatic obstruction by transurethral operations, beginning with the catheter knife of Guthrie in 1834, and then later the instruments of Mercier and Bottini. He pointed out that these early attempts failed because surgeons failed to appreciate the necessity for preliminary drainage of the bladder, and because the obstructing gland could not be inspected directly. Young's punch, brought out in 1911, obviated the second difficulty, while experience had eliminated the first. He prefers the Braasch instrument because of the ample size and direct illumination which permit adequate visualization of the urethra and the removal of large pieces of the gland; bleeding is controlled by electrocoagulation of the individual vessels under direct vision.

Dr. Creevy recognized four indications for the use of the prostatic punch, namely, the median fibrous bar at the vesical outlet, whether inflammatory, postoperative, or carcinomatous (palliative); postoperative infection of the surgical capsule; small lateral lobe hypertrophies, and in certain lesions of doubtful nature the instrument may be used to secure tissue for microscopic examination (recognition of early carcinoma).

He cited the low mortality of the punch operations in the hands of experts (Young, Caulk, Bumpus)—three-tenths of one per cent in over 1,000 cases, but regretted that studies of late results in large series of cases were not available.

He showed three cases illustrating different problems.

Case 1.—The patient had had a persistent suprapubic fistula and total urinary incontinence for 18 months after prostatectomy done elsewhere. Removal of a cicatricial postoperative bar by the punch together with postoperative dilatations of the urethra had resulted in complete return of continence.

Case 2.—This was the case of a man with an inflammatory bar who had been subjected to the operation 48 hours before. He was already up and about in comfort and was shown to illustrate the minor character of the postoperative reaction in many cases.

Case 3.—This man was admitted with auricular fibrillation and cardiac decompensation complicated by a small lateral lobe hyperthrophy of the prostate with 150 c.c. of foul residual urine. After the compensation had returned under the care of the Medical Service, the punch had been used and the residual urine relieved in a situation in which prostatectomy would have proved hazardous.

Dr. Creevy pointed out that Caulk and Bumpus were using the punch in large lateral lobe obstructions with good immediate results, but could not predict whether these would be permanent.

DISCUSSION

Dr. E. A. Regnier asked what method is carried out in drainage of the bladder following the punch operation.

Dr. Creevy said that he had been in the habit of electro-coagulating each bleeding point and omitting the indwelling catheter. If there is any evidence of postoperative urinary retention it is relieved by catheterization.

Dr. Theodore Sweetser asked about cases reported in England of obstruction after prostatectomy and if Dr. Creevy would consider that this was a good procedure in relieving that scar tissue.

Dr. Creevy stated that he had carried this out in four cases with very satisfactory results, but that his experience extended over only one year and he could not say anything about the late results.

Dr. H. A. Carlson (University Hospital) presented two cases of malignant melanoma with regional metastasis in which operation had been performed.

Case 1.—This patient was a male 63 years old. In July, 1929, he first noticed that he had a pigmented mole on the back of his neck. In January, 1930, he observed that he had small masses on the right side of his neck. The glands continued to enlarge and in May his physician removed a specimen for microscopic examination. This was sent to Dr. E. T. Bell, who returned a diagnosis of malignant melanoma. Excision of the primary melanoma and block dissection of the neck was performed by Dr. Wangensteen on May 14, 1930. Subsequently he had deep roentgen therapy. He was followed in the dispensary and in November a nodule was removed from the right deltoid region which was found to be a recurrence. Since that time no evidence of recurrence has been found. He has gained 25 pounds in weight since the operation.

Case 2.—This patient was a male, 58 years of age. He had had a small subcutaneous nodule on the tip of the left ear for many years. It was injured in June, 1928, by a wood splinter and the resulting ulcer failed to heal. In July, 1929, he went to the Minneapolis General Hospital because of pain. On biopsy, the diagnosis was malignant melanoma. He was operated on by Dr. W. T. Peyton at the University Hospital August 5, 1929. The primary lesion was excised and a block dissection of the neck performed on the left side where enlarged nodes were present. X-ray therapy was instituted. There has been no evidence of recurrence.

DISCUSSION

Dr. Wangensteen stated that the early excision of the regional lymph nodes in malignant melanoma demands emphasis. So frequently one sees instances in which the local lesion had been excised and nothing done to the local nodes. Just as the excision of the regional lymph nodes is an important principle in the treatment of carcinoma, Dr. Wangensteen felt that the early removal of the regional lymphatics together with the local lesion would bring about better results. He admitted that melanoma may not always spread by the lymphatics, but felt that it occurred with such regularity that the excision of the lymph nodes should be the accepted mode of dealing with malignant melanoma of the skin. He stated that their experience at the University Hospital indicated that these tumors are not radio-sensitive. In the summer of 1928, Dr. Wangensteen said that Mr. Sampson Handley of the Middlesex Hospital in London had shown three instances at the International Cancer Conference in which this "complete" operation had been done. Handley removed the intervening lymphatic vessels in the fascia as well. All of these patients were quite well and one had survived for about 18 years.

Dr. A. T. Mann recalled a very interesting case that would bear out the lack of malignancy in some of these melanomata. A girl about 13 years old came in with a melanoma on the back which was like a very large boil in shape and had considerable mass to it. It was not one of these moles, although it may have been to start with. It was fairly widely excised but in excising it one could see black spots way back in the muscles of the back. It was decided that this was too widely distributed for excision of the secondaries and she was closed up with those black spots still there. She walked into the office two years later, apparently in perfect health. Her back was smooth and she showed no signs of recurrence.

Dr. Wangensteen said that a previous experience that had terminated unfavorably had taught him that the closure of the skin wound was an important item in protecting the patient with a deep wound from infection and, in the case demonstrated by Dr. Carlson, he had performed an atypical Z-plasty at the initial operation to help cover the defect.

Dr. Horace G. Scott (University Hospital) discussed "The Nutrition Problem in Fistula of the Small Intestine," and showed a boy, 13 years of age, with the following history:

In January, 1928, the boy had an operation for ruptured appendix. The appendix was removed and drainage instituted. He drained for 10 days. Six months later he developed an incisional hernia and was reoperated, at which time adhesions were found. He was fairly well until November, 1930, when he developed intermittent crampy, colicky pains in the abdomen followed by nausea and vomiting. His symptoms persisted for four days before he entered the University Hospital. On admission he was found to be very ill; his pulse was 164 and he was quite dehydrated. There was considerable distention and diffuse tenderness, muscle spasm and rigidity present over the entire abdomen. Flat plates of the abdomen revealed gas in the small intestine. A preoperative diagnosis of intestinal obstruction was made, probably of the strangulating type. At operation a reddish, black mass was found which proved to be a two-foot loop of lower ileum. A Mikulicz exteriorization of the bowel was done and the strangulated segment resected. Catheters were placed in both segments of the bowel and the content from the proximal loop was run into the distal loop under the influence of gravity. After a few days, however, the catheters became loose and the introduction of the proximal loop content into the distal loop was found to be impractical. The boy lost approximately 1,500 c.c. of food and fluid a day from the proximal loop. As a result he steadily lost weight on a general diet, his weight falling from 87 to 49 pounds over a six-weeks' period. The last two weeks of this period he was placed on a special high carbohydrate diet. This diet apparently did not help to check his falling weight. In fact, it apparently aggravated peristalsis. Observation of the proximal loop revealed a forceful frequent discharge of yellow fluid and undigested food occurring within thirty minutes after eating. The diet was then changed. The carbohydrates were cut down and the emulsified fats were increased by giving the boy a glass of half milk and cream at frequent intervals. Within a couple of days after this change in diet had been effected, the discharge from the proximal loop was observed to be less forceful, and to contain less and less undigested food. After a week's time it was slowed up to such an extent that after eating a meal it was two or three hours before any fluids were discharged. The boy then began to regain his lost weight. Three weeks later he was re-operated upon and the continuity of the gut was re-established. He then went home. Ten days later he had another acute obstruction attack. The abdomen was again opened. This time a large loop of jejunum was strangulated. After release of the strangulating band of adhesions the color of the gut returned. The abdomen was then closed with enterostomy drainage of the proximal loop and the boy made an uneventful recovery.

Dr. Scott stated that this case illustrates one important fact which is overlooked in the feeding of the fistula case, namely, that carbohydrates, although easily assimilated, enhance the peristaltic activity of the bowel; whereas emulsified fats cause a slowing of peristalsis which allows more time for the absorption of food and fluids lying within the gut.

DISCUSSION

Dr. E. A. Regnier asked if it had been possible at the second operation to determine where the site of the original enterostomy had been.

Dr. Wangensteen said it was about two feet from the cecum and that, whereas in adults no difficulty is to be anticipated from such a fistula, children notoriously stand small intestinal fistula of a complete nature very poorly. He said in the literature instances of decline in health and loss of weight are to be found reported after intestinal resections and anastomoses that an adult would well tolerate.

One other point relative to the case presented by Dr. Scott, he felt should be emphasized, viz., the value of high protein feeding in such instances. There was a good urinary output on an oral intake of fluid, but the tissues would not retain water until there was a liberal assimilation of protein. Then the normal turgor returned to the skin.

Dr. Wangensteen explained that Dr. McQuarrie, Chief of the Pediatrics Department in the Hospital, had rightfully called attention to the necessity for high protein feeding in this boy, and the boy's subsequent gain in weight was undoubtedly due in large measure, he felt, to this suggestion of Dr. McQuarrie.

Dr. Ralph Knight (Minneapolis) discussed "Selection of Anesthetics."

Spinal anesthesia, he stated, has taken a very important place in all operations below the diaphragm, and its advantages are so great that the tendency is to increase its use for all such operations which are not so minor as to be done with very brief gas anesthesias or very simple block infiltration. It affords a degree of relaxation not obtained by inhalation anesthesia.

Probable contraindications are: marked hypertension and hypotension, especially with debility from wasting or toxic illness, shock or hemorrhage. These are, however, contraindications for other anesthetics except possibly local or block anesthesia and probably the use of spinal anesthesia with very careful and improved technic will be gradually extended to the poorer risks.

Spinocaine had been used almost exclusively because it was thought best to use one method until a fair-sized series had been run, according to Dr. Knight. There had been a few failures and some had not lasted long enough for the operation. His personal impression is that spinocaine anesthesias tend to last longer than simple novocaine spinals, but that spinocaine exhibits a few more failures of sufficient anesthesia than does novocaine. Theoretically, at least, there is a little less margin of safety with spinocaine because of the technic of raising the head of the table until the desired level of anesthesia has been reached. Practically, this is probably neutralized by meticulous care in watching the blood pressure and lowering the head well in case of a drop below 70 per cent of the orginal, or in any case below 90 mm. Preliminary ephedrine is still given, and epinephrin in case the blood pressure falls, because it was felt that the patients are made more comfortable and get along better. Spinal anesthesia has not been used for work above the diaphragm, Dr. Knight stated. When spinal anesthesia must be reinforced by inhalation, ethylene is the agent of choice as it is usually sufficient without ether.

Ether is still the anesthetic of choice for a large number of operations about the head, especially in children, and will probably remain so unless alkoform or some other agent proves of greater value. Chloroform is often the agent of choice when deep anesthesia is needed for the use of the cautery about the head.

Local anesthesia has a wide field and is used liberally above the diaphragm, frequently being supplemented with a gas, especially for neck and chest work, the choice for the supplementing gas being ethylene.

Special anesthetic methods such as rectal and intravenous administration have not been found serviceable enough to be used to any great extent. They have a distinct field for operations which make local, spinal, and inhalation anesthesias impractical to administer. Ether by rectum is felt to be the most satisfactory in this field. It has a special indication for brain surgery as inhalation anesthesia has been found to increase the intracranial pressure. Rectal anesthesia has one great disadvantage in that recovery is sometimes very prolonged and the patient must be closely watched all this time to prevent pharyngeal occlusion.

The following figures show the anesthetics which have been selected for various regions and operative procedures during the past year (March 1, 1930, to February 28, 1931) at the University Hospital:

3,703 anesthetics exclusive of obstetrics, but including all other general and special surgical services.
14 different anesthetic drugs.
50 different combinations.
120 H. M. C., 17 per cent reinforced.
23 avertin, colonic, 60 per cent reinforced—all head, neck and bronchoscopies.
44 ether, colonic, 57 per cent reinforced—all head, neck, upper extremities and spine.
482 cocaine, including 20 eye, 47 nose and throat, 50 bronchoscopies, 365 cystoscopies.
992 novocaine infiltration, 22 per cent reinforced.
22 novocaine, spinal, 22 per cent reinforced.
10 novocaine, sacral, including 8 prostatectomies.
778 spinocaine, spinal, 15 per cent reinforced.
450 nitrous oxide basic, 38 per cent reinforced.
361 ethylene basic, 27 per cent reinforced.
339 ether inhalation.
20 chloroform, all about head, except 2 bronchoscopies.
15 ethyl chloride, including 5 cystoscopies.

By Regions:

126 upper abdomen: 61 per cent spinocaine alone; 34 per cent spinocaine plus inhalation; 5 per cent inhalation alone.
381 lower abdomen: 56 per cent spinal alone; 12 per cent spinal plus inhalation; 2 per cent novocaine infiltration; 29 per cent inhalation alone.
511 cystoscopies: 12 per cent H. M. C.; 71 per cent cocaine; 7 per cent spinal; 9 per cent inhalation.
142 prostatectomies and cystotomies: 71 per cent H. M. C.; 4 per cent spinocaine; 2 per cent spinocaine plus inhalation; 5 per cent novocaine, sacral; 14 per cent novocaine infiltration; 18 per cent inhalation.
967 below diaphragm—outside of abdomen and bladder: 30 per cent spinocaine; 2 per cent spinocaine plus inhalation; 1.4 per cent novocaine, spinal; 5.6 per cent novocaine infiltration; 60 per cent inhalation.

Regions above the diaphragm have not been tabulated for this report because the wide variety of operations done and the wide variety of anesthetic combinations used would make it too voluminous.

There were six deaths during the year in which the anesthetic should be evaluated as to whether it was a cause or contributing cause. All were extremely poor risks.

Case 1.—A very toxic man, aged 68, died under spinocaine anesthesia during operation for a large subdiaphragmatic abscess from a perforated duodenal ulcer of more than a week's standing.

Case 2.—A frail woman, aged 42, died under novocaine and ethylene anesthesia for thoracoplasty for pulmonary tuberculosis. She had acromegaly, was a very poor risk and died as the incision was made.

Case 3.—A frail woman, aged 46, died suddenly after 95 minutes of satisfactory ethylene anesthesia for operation for rheumatic contractures of the knees. Autopsy showed brain tumor with conus herniation of cerebellum into foramen magnum.

Case 4.—A man, aged 55, who had a very extensive carcinoma of the tongue died after only a few minutes of ethylene for ligation of the external carotid artery.

Case 5.—A man, aged 67, who had previously had extensive resection of the tongue, lip and mandible for carcinoma died after 10 minutes of chloroform anesthesia just as cauterization of a recurrence started.

Case 6.—A man, aged 72, had his maxilla resected under colonic ether and died 8 hours later before he had entirely recovered from the anesthesia. It was believed that his pharynx might have become occluded during a brief time when the attendant was away.

Dr. Knight stated that in each of these instances there were contributing factors and not in a single instance could one say arbitrarily that the anesthesia alone was responsible.

Dr. Melville H. Manson (University Hospital) discussed "Gas Bacillus Infection" with special reference to its occurrence postoperatively in cases of preëxisting gangrene and chronic ulcers.

There had been 9 cases of gas gangrene at the University Hospitals during the past two years. Five of these followed operative procedures and two in particular led to further investigations of the infection. These two cases developed in amputation stumps. The operations were performed for chronic, painful ulcers, which had resisted all conservative treatment. Two of the other cases were in patients who had preëxisting gangrene. The only deaths in the nine cases were the two which developed following amputations for chronic ulcers.

Dr. Manson said that the literature contained only a few references to the development of gas gangrene in conditions of this sort. He had cultured a series of chronic ulcers and found pathogenic, gas-producing anaërobes in approximately 30 per cent.

He stated that the use of polyanaërobic or specific anaërobic antitoxins had not been accepted unreservedly by the profession. Evidence was presented which showed the efficacy of the antitoxins. During the World War Saquepee gave polyanaërobic antitoxin to 319 wounded men with a resulting incidence of gas gangrene of 1.17 per cent. In a control series the incidence was 7.2 per cent. In a series of 191 developed cases, the mortality in those treated with antitoxin was 13.9 per cent, while in the same region the mortality of the untreated cases was 75 per cent. Ivens gave a polyanaërobic antitoxin to 433 cases in which there were

30 cases of gas gangrene when first seen. In this series there was one death. Henry and Lacey injected 50 guinea pigs with cultures obtained from cases of gas gangrene. Of this number 44 were pathogenic. To the 44 guinea pigs they gave antitoxins of Bacillus welchi and Vilrion septique, which protected 33 of the animals. To the 11 non-protected animals they gave antitoxins of Bacillus edematiens which protected six. From the five unprotected pigs, cultures of Bacillus fallax were obtained in two, and three had unidentified organisms.

Dr. Manson said that the principles of surgical treatment were well established but emphasized the point that no tourniquet should be used when amputation is done. A case was related in which the shutting-off of the circulation for only a few minutes was responsible for the development of a case of gas gangrene developing in a preëxisting gangrene.

He believed that chronic ulcers should be included with preëxisting gangrene as possible source of gas bacillus infections following operative procedures.

Dr. W. A. O'Brien (University Hospital) told of the development of the Pathological Department of the University Hospitals. While an integral part of the Department of Pathology of the Medical School, it functions as a separate unit.

There were 645 tissues examined in 1925. In 1930, the number had grown to 2,331. Approximately 225 examinations are being made monthly during the present year. During the same time postmortem examinations increased from 83 to 218. Approximately 24 examinations per month are being done this year. Part of this increase in autopsies is due to the increased bed capacity and part to an increased percentage of permissions (53.2–78.4 per cent). The University Hospitals are among the first 10 in this country in percentage of autopsies. The Mayo Clinic, the Minneapolis General Hospital and the University Hospitals have the highest state percentage of any group in this country or Canada. Much of the percentage increase is due to the splendid coöperation received from the hospital services.

All tissues removed at operation are routinely examined (except tonsils and adenoids, which are done on request). Surgical pathology has undergone a distinct change due to the increased number of biopsies and the development of a uniform terminology for clinical pathological correlation. The diagnosis of chronic appendicitis is not made. Appendices are grouped as follows: (1) No active inflammation (interval operation or removal at another operation); (2) Peritonitis (arising from within or without); (3) Acute suppurative appendicitis; (4) Obliterated appendix. By using this method excellent diagnostic and prognostic correlations are obtained.

Routine curettage and cervical biopsy are done on all bleeding women and those who have a cervical lesion. A distinct type of endometrium showing hyperplasia and cysts (Swiss cheese) is frequently found near the menopause. It is apparently due to ovarian changes (granulosal cell) and responds to radiation.

Thyroid glands are grouped under a few headings: (1) hyperplasia; (2) adenomatous; (3) colloid; (4) thyroiditis, and (5) malignant. No attempt is made to predict the type of disease in the patients. Patients with glands showing inflammatory changes are routinely followed for signs of hypothyroidism.

Dr. O'Brien said that tumor grading (typing) is here to stay. It has always been done by most pathologists. Giving numbers to various types is helpful in comparing the work of various investigators and attempting prognosis—tumors that are less malignant (types 1-2) and more malignant (types 3-4). Type 1 is usually borderline malignancy. Type 2 is fairly definite. Types 3-4 vary because some men classify by the degree of differentiation and others by the most malignant part; taken together they constitute a rather uniform group in the various reports in the literature.

Brain tumors are classified by the Cushing-Bailey method; some are easy to group (spongeoblastoma, medulloblastoma, and astrocytoma) while others are more difficult.

Certain types of specimens require a different number of sections. Apparently all appendices should have three sections—base, middle and tip. Large ulcers of the stomach and suspicious prostate glands require an unusually large number. In one of their cases at the hospital more than 40 sections were made of a large gastric ulcer before malignancy was found.

Breasts showing diffuse induration (after 25) present a diagnostic problem. Surgeons do not hesitate to remove a single definite lump for opinion, but are apparently content with a diagnosis of diffuse cystic disease when diffuse lumps are present. This method has been abandoned at the University Hospitals and all definite diffuse lumps are removed for opinion. Diffuse cystic disease may mask carcinoma. Recurrent tumors of all types are removed for diagnosis and prognosis. Some of them are of low grade malignancy and secondary operations may be done with benefit to the patients. Centrifuged fluid and needle biopsies are on the increase. Ten years ago one-third of all biopsies were benign and two-thirds malignant; today conditions are completely reversed. Special pathological services have been developed in the Division of Dermatology under the direction of Dr. Henry E. Michelson; in the Division of Neurology under the direction of Dr. J. C. McKinley; in the Division of Ophthalmology under the direction of Dr. Walter E. Camp.

There are three full-time Fellows on the Pathology Service at the present time: Drs. O. S. Randall, B. J. Pearson, and E. C. Hendrickson. Under supervision they examine and report all surgical specimens and do the autopsies. In addition they assist in preparing material (case reports and literature abstracts) for the weekly general staff meeting, and show the surgical specimens and microscopic slides at the weekly surgical pathological conference. All are planning surgical careers.

Dr. O'Brien stated that the Department of Pathology of the University Hospitals is showing a healthy growth. The diagnosis of biopsies constitutes more than one-half of the work. Experience in surgical pathology and postmortem examinations should be part of the training of every surgeon. Opportunities are provided for three full-time Fellows at the University Hospitals at the present time.

Dr. O. H. Wangensteen (University Hospital) presented a group of thoracic cases. The first group illustrated interesting features of empyema.

Case 1.—The first patient was a girl of three, who had recently had pneumonia. Later fever recurred and pus was aspirated from the right chest. The X-ray films showed a density over the middle portion of the right lung with a clear costophrenic angle. The impression from the films was that an interlobar empyema in the main fissure was present. A needle was inserted in the fifth intercostal space and 35 c.c. of a thick pus was obtained in which the pneumococcus was demonstrated. Two subsequent tappings were negative and, because of continued fever of 101° to 103° F., the fifth rib was resected. A large amount of pus and a large fibrin plug about the size of a man's hand was obtained. A drainage tube was inserted and the fever promptly came down. A subsequent X-ray plate showed no pneumothorax corroborating the impression of an encapsulated empyema. Irrigation of the small cavity with Dakin's solution together with blowing on bottles, Dr. Wangensteen felt, should quickly expand the lung and obliterate the cavity. The fibrin plug had prevented successful aspiration, in his opinion. Whereas aspiration, as recommended by Brenneman, is a commendable feature of empyema treatment in infants, Dr. Wangensteen felt that drainage in older children was the wiser plan.

Case 2.—Dr. Wangensteen referred to another case with an interlobar empyema and demonstrated X-ray films. The patient was a boy of 8, who had become ill with pneumonia in December, 1929. After convalescence, the fever recurred, and in May, 1930, operation was performed elsewhere for empyema of the left chest. A free pleural space and no pus was found at operation. Drainage was instituted but without effect. In August, 1930, the boy was admitted to the University Hospital with a steeple-chase type of temperature. There was no sputum. X-ray examination showed a fluid level with air above it. The costophrenic sinus was clear. The absence of sputum and the presence of air in the chest ruled out a lung abscess and a diagnosis of an encapsulated empyema was made. At the first operation, a free pleural space was again found and two ribs were removed and an iodoform gauze tampon was placed over the parietal pleura. Eight days later the wound was opened up and considerable pus was evacuated by incision after needling the thickened membrane overlying the encapsulation. There was prompt improvement and the boy returned to school.

Case 3.—The next patient was a boy of 24 years upon whom Dr. Wangensteen had performed decortication to obtain expansion of the lung for recurrent empyema. During the preceding nine years the patient had been operated upon six times for acute empyema. The patient had promptly gotten well following each operation but he had never stayed well because of an unobliterated empyema cavity. X-ray films, made after the injection of iodized oil, demonstrated that the sinus tract extended from the lower right lateral chest wall up toward the hilum of the lung. It was Dr. Wangensteen's first impression that the lung would be atelectatic after so many years and he believed that the chest wall would have to be brought to the lung by the Schede deribbing operation. At the initial procedure segments of five ribs were removed and a large dinner-plate sized area of parietal pleura more than an inch in thickness was removed. This procedure failed to obliterate the cavity completely and five weeks later the wound was opened again. In the interim the patient had blown on bottles in an effort to expand the lung but without any result. At the second operative procedure a membrane about 2 mm. in thickness, which at the initial operation was thought to be the visceral pleura, was incised. It was found that this membrane could be peeled off the lung much in the manner that one peels an orange. The lung expanded immediately and filled the wound; there was no bleeding and the restraining membrane was removed without breaking into lung substance. A Z-plasty was employed to cover the skin defect at the conclusion of the operation. Because of tension the skin closure gave way in part and when granulations later formed over the lung, skin implants were used to fill in the defect. The cavity has been completely obliterated and the patient has returned to work. Dr. Wangensteen stated that he had subsequently employed the decortication method (Delorme procedure) in other cases of empyema with complete satisfaction. He had been surprised at the minimal amount of bleeding and stated that the patients were pleased in being spared the greater deformity of the chest wall of the Schede operation.

The next group of cases shown by Dr. Wangensteen were of suppuration within the lung.

Case 4.—A women, 27 years of age, in January, 1931, developed a parametritis after an abortion. About three weeks ago she was brought to the University Hospital and admitted to the gynecological service because of a continued septic type of fever. Examination at that time showed a fixed uterus with dense adnexal masses. There was also slight tenderness and rigidity in the lower abdomen. Later the patient developed pain in the chest and X-ray examination showed an infiltration in the lower right lobe and an elevated diaphragm which was found to be immobile on fluoroscopy. An X-ray diagnosis of subphrenic and pulmonary abscess was made. Findings of a pneumonia were present in the lower right lobe. The patient had a persistently high fever and an extremely rapid pulse and appeared very ill. The question arose as to whether drainage for subphrenic abscess should be instituted. Physical examination failed to demonstrate any tenderness in the subhepatic or suprahepatic areas on the right side. Aspiration of the pleural space obtained no fluid as is often present when a subphrenic abscess exists. Aspiration of the subphrenic space failed to obtain pus. It was, therefore, felt that the mere presence of a high fixed diaphragm could not be considered conclusive for the presence of a subphrenic abscess. Postural drainage was instituted and the patient began expectorating a foul purulent sputum. The temperature has gradually receded and the patient's condition has markedly improved. Dr. Wangensteen said there were two possible explanations for the development of the lung abscess; one is that it was metastatic in origin; the more likely explanation would appear to be that the bronchopneumonia resulted in a residual abscess. The actual mechanism of the origin of the lung abscess might perhaps never be apparent, but the absence of tenderness over the lower chest on the right together with failure to obtain fluid from the pleural cavity and pus beneath the diaphragm, Dr. Wangensteen felt, militated against its origin from a subphrenic abscess.

Dr. Wangensteen referred to the fact that subphrenic infections frequently make their way through the diaphragm, whereas intrapleural infections rarely if ever reach the peritoneal cavity by direct extension. Küttner has shown that the lymphatics of the subdiaphragmatic peritoneum perforate the diaphragm, affording an explanation for the frequent presence of a transudate in the pleural cavity, accompanying subdiaphragmatic suppuration. Dr. Wangensteen related that he had recently seen on the Gynecological service a patient who had developed a diffuse peritonitis from the sudden perforation of a residual pelvic abscess into the peritoneal cavity. Later empyema developed. At autopsy a perforation of the left diaphragm near the esophageal aperture disclosed its origin.

Dr. Wangensteen referred to a patient who had recently been operated upon for a perinephritic abscess at the University Hospital who had developed a lung abscess by extension through the diaphragm. It, too, cleared up spontaneously with postural drainage as in the instance of the lung abscess just demonstrated.

Case 5.—A woman of 28 years was then shown, who had been sent to a sanatorium for tuberculosis in the fall of 1929 because of cough, fever, night sweats, weakness, and sputum. These symptoms had begun three weeks after tonsillectomy under ether. At the sanatorium numerous sputum examinations failed to reveal tubercle bacilli and a diagnosis of lung abscess was made. Pneumothorax was instituted and the patient improved but the fever continued, though in lesser grade, and the density in the lung persisted. She was admitted to the University Hospital early in 1930. Three bronchoscopic aspirations were done and the patient was dismissed in May, 1930, as well. Later in the summer she returned to report that she had had a small hemorrhage. An X-ray film then demonstrated a small cavity in the previously consolidated area. This has since healed and she has remained quite well.

Dr. Wangensteen related that another patient had recently returned for observation whom he had treated because of a lung abscess in the upper right lobe in January of this year. On postural drainage it had entirely cleared up and the X-rays now show the rather large cavity initially present to be healed.

Case 6.—The history of a patient, aged 25, who was then in the University Hospital but too ill to be shown, was briefly reviewed. The patient had been successfully operated upon at another hospital for acute suppurative appendicitis with local peritonitis. During the convalescence a central type of lung abscess developed in the lower lobe on the right side. Pneumothorax was given and considerable sputum was evacuated with marked improvement. Two other refills were given and the patient though not yet ambulatory left the hospital apparently getting along very well. A few days later the boy became very ill again. He was admitted to the University Hospital a few days ago with a persistently high fever, rapid pulse and foul bloody sputum. He had been irrational since admission. X-ray examination revealed a cavity in the apex of the lower right lobe. There was still a little air in the pleural space with no evidence of an exudate. An attempt had been made to reëstablish the pneumothorax before admission to the hospital but the attempt had not been successful. Three weeks had intervened since the last refill. Examination of the sputum after washing showed fusiform bacilli and spirilla present in large numbers. A subsequent X-ray examination showed spreading cavitation in the entire right lung. A diagnosis of pulmonary gangrene was made, due probably to secondary invasion from organisms in the mouth. The patient had been given neoarsphenamine intravenously, but without apparent effect.* Kline and Berger, of Cleveland, Dr. Wangensteen stated, had been enthusiastic about the treatment of pulmonary gangrene with arsenicals. Most chest surgeons, however, he stated were conservative in their estimate of its value.

It should be stated that abscesses centrally located in the lung already in communication with a bronchus, as in this instance, are the only ones in which pneumothorax is indicated. When pneumothorax is employed in the compression of an abscess located in the periphery of the lung, the hazard of empyema is invited. Though Whittemore and Balboni, in 1928, found a large number of instances reported in the literature in which pneumothorax had been highly successful in dealing with lung abscess, they had only two successes in 18 cases. It need scarcely be mentioned that aspiration of a suspected lung abscess for diagnosis through a nonadherent pleura is a dangerous procedure.

Case 7.—The X-ray films were demonstrated in the case of a woman of 40 years, who in July, 1930, developed chills and fever, followed by cough and expectoration of foul sputum about ten days after tonsillectomy under ether. She had been admitted to the University Hospital in September, raising about 500 c.c. of sputum a day. The patient's appetite was poor and there had been considerable weight loss. The temperature ran as high as 102° F. daily. Postural drainage and repeated bronchoscopic aspiration were without effect. The abscess was represented by a diffuse consolidation of the upper two lobes of the right lung. Pneumothorax was ineffectual. In October, external drainage was done, the surgical endotherm needle being employed to give hemostasis. Two operative procedures were necessary to give adequate drainage in the carnified lung. The sputum quickly diminished to a small amount and the patient became afebrile. She has gained in weight and at the present time has no sputum. The process in the lung has been slow in resolution and has not entirely cleared up. Whenever the patient "catches cold" she has 10 to 30 c.c. of sputum for a few days. As long as there is any trace of consolidation persisting in the lung on X-ray examination a small tube will be worn to keep the wound open. The bronchial fistulæ present will in all likelihood close spontaneously. In event they do not, a muscle flap may be employed to close them.

---

*Note: This patient has since died.

Dr. Wangensteen stated that in his experience fully 50 per cent of acute lung abscesses healed under conservative treatment of bed rest, postural drainage, bronchoscopic aspiration and compression by pneumothorax in selected cases; one chronic abscess of almost a year's duration in this series was completely healed following bronchoscopic aspiration. In those in which conservative measures fail, external drainage must be done.

Dr. Wangensteen said that satisfactory experimental evidence had finally been adduced to substantiate the opinion long held by clinicians that the majority of abscesses are due to aspiration of a foreign body or septic material into the lung. Tonsillectomy under ether is probably the most frequent single cause in the development of lung abscess. After loss of the swallowing reflex in deep ether anesthesia, blood is aspirated into the lung. The same may occur with poor hemostasis when tonsillectomy is done under local anesthesia.

A group of cases with bronchiectasis was next demonstrated.

Case 8.—A girl of 13 years, admitted to the University Hospital about 4 months ago, gave a history of having had whooping cough six years before, since which time there had been cough and sputum. In winter the patient has exacerbations of her complaint. There has been daily slight fever running usually up as high as 100.8° F. The sputum varies between 90 and 350 c.c. Lipiodol filling of the bronchi by the passive method of Ochsner showed cylindrical dilatation of all the bronchi of the left lower lobe with a few saccular dilatations present. There was slight dilatation of a few bronchi on the right but the disease was preponderantly unilateral. A left phrenic exeresis was done with some diminution in the sputum and slight general improvement. After three weeks' observation, pneumothorax was instituted on the left, with definite improvement. The temperature has been normal for more than two months. There is still slight cough but the sputum is only 4 to 20 c.c. daily in amount. The patient has gained in weight and has returned to school.

Dr. Wangensteen stated that a patient had recently been admitted for phrenic exeresis for bronchiectasis in whom Dr. Myers had already carried on pneumothorax compression for four years. The patient had been working consistently, but hoped that elevation and paralysis of the diaphragm would relieve her of a slight residual sputum.

Case 9.—A woman of 43 years was presented, who had cough and considerable sputum since the age of 38. There had been considerable weight loss and 175 to 240 c.c. of sputum was brought up daily. Exeresis of the phrenic nerve performed about two months ago had resulted in almost complete disappearance of sputum. There had been a persistence of slight cough, however, and recently the patient has been bringing up a little sputum. She returned to the chest clinic in the Out-patient Department of the University Hospital and was admitted to the hospital for her first neumothorax treatment, which she received today.

Dr. Wangensteen stated that it was gratifying to note the improvement in the patients with conservative types of treatment. He said that he had not done any complete deribbing operations as practiced by Hedblom in such cases, but stated that Dr. Kinsella and he had worked together on two cases of advanced bronchiectasis in which the conservative procedures of phrenectomy and pneumothorax followed by thoracoplasty over the lower left chest had been inffectual. They had then done the cautery lobectomy of Graham of the involved lung tissue in these two cases.

Dr. Wangensteen called attention to Dr. Graham's observation that many of the cases of bronchiectasis apparently follow infection of the paranasal sinuses. Alton Ochsner has been able to show that lipiodol placed in the nasopharynx is aspirated into the lung during sleep. The satisfactory eradication of sinus infection is therefore an important item in the treatment. In a number of cases of bronchiectasis in which repeated passive filling of the bronchi with lipiodol had been used, as suggested by Ochsner, definite improvement had been observed in only a few isolated instances.

In the next group of cases shown, surgery had been performed for pulmonary tuberculosis. Dr. Wangensteen stated that a demand had been created for this service by the superintendents of the tuberculosis sanatoria of the State, and that ten beds had been set aside at the University Hospital for the surgical treatment of such cases.

Case 10.—This young lady, aged 20, had been ill with pulmonary tuberculosis for two years. She had had bed rest at a sanatorium for fifteen months. She has recently maintained her weight and there has been only slight fever. The sputum is positive for tubercle bacilli and varies in amount up to 90 c.c. a day. X-ray examination reveals a large cavity in the lower left lobe. Unfortunately there is already a small cavity in the apex of the right lobe. Pneumothorax had been given on the left over a considerable period, since which time there had been definite improvement. The large cavities in the left lung were still open, however, owing to the presence of broad adhesions, and Dr. Wangensteen was of the opinion that a successful issue did not appear likely unless these could be effectually dealt with. The left diaphragm was not observed to move on fluoroscopy of the chest. The patient has a chronic proliferative type of disease for which compression by thoracoplasty is especially indicated. The small cavity in the apex of the right lung in all probability had its origin from the large ones on the left and if they can be sealed the lesion in the right lung may heal. An upper thoracoplasty in which paravertebral segments of the upper six ribs are removed subperiosteally has been done, and X-ray examination shows considerable diminution of size in the upper cavity. The air in the pleural cavity which would tend to interfere with the collapse was aspirated before the operative procedure. The patient had little reaction from the procedure and will be ready for the lower stage in a few days, at which time segments of the seventh to the eleventh ribs inclusive will be removed.

Dr. Wangensteen explained that it was important to cut the ribs as close to the spine as possible and that he exposed the articulations of the ribs with the transverse processes of the vertebræ, at which point they were divided. He felt that removal of wide segments of the upper two ribs was very important in obtaining collapse of apical cavities. With the arm pulled forward it was not difficult to sever the first rib as far proximally as the scalene tubercle. It has been pointed out by statistical studies from tuberculosis sanatoria that about 85 per cent of cases with persistent cavities are dead after three years. In event the small cavity on the right fails to heal, an apicolysis or excision of the three upper ribs should be done. In the experimental laboratory of the Department of Surgery at the University, Dr. Kinsella has done very extensive bilateral thoracoplasty in both dogs and monkeys, which procedures seem to be well borne. Bilateral pneumothorax in the treatment of tuberculosis has long been practiced.

Case 11.—The X-rays were demonstrated of a girl, aged 25 years, who had had pulmonary tuberculosis for eight years with large bilateral cavities, who was recently referred for thoracoplasty. There was evidence of spreading exudative tuberculosis in the base of one lung, also, and Dr. Myers and Dr. Wangensteen both felt that it was too late to do the patient any good. As in the case just demonstrated, so here the disease for a long time had probably been largely unilateral, at which time thoracoplasty would probably have been an effective remedy.

Case 12.—The X-ray films of a woman, aged 32 years, were shown who had a cavity that measured 11 × 13 centimeters in the left lung. The patient had been treated with pneumothorax and at one time it was believed that it was a large annular pneumothorax and not a cavity. The sputum level so nicely demonstrated in these films, taken in the standing posture, established the nature of the lesion. A phrenic exeresis followed by three-stage thoracoplasty had been done. After the typical two-stage paravertebral thoracoplasty, the anterior segments of the upper six ribs were also removed through an incision below the axilla between the pectoral and latissimus dorsi muscles. This large cavity was reduced to a cavity measuring 2 × 3 cm. in diameter, by these operative procedures. After the last operation, performed about 8 weeks ago, the patient was allowed to go home and she plans to return shortly for X-ray evidence of whether or not the cavity still persists. Persistence of the cavity is synonymous with continuance of the disease. In the event the cavity still persists, an apicolysis is indicated.

Case 13.—The next patient, a girl, 22 years of age, had had tuberculosis for six years. After bed rest for a few months she was well for two years, at which time a hemorrhage occurred. During the last three years she had been in bed continuously. Pneumothorax had been ineffectual because of adhesions. Upon admission to the hospital tubercle bacilli were found in the sputum which averaged about 60 c.c. daily. One large cavity and a few small cavities were visualized in the left upper lobe. A phrenic exeresis and a two-stage thoracoplasty had been done. When the patient left the hospital three months ago she had no sputum. She came in today for this presentation and for an X-ray examination. The latter shows a splendid collapse with complete obliteration of the cavities.

Case 14.—This patient, aged 50 years, had had tuberculosis for almost thirty years. Twenty-eight years ago he was given bed rest because of tuberculosis. His disease became arrested and he remained well until fourteen years ago, when a breakdown occurred. He had had sanatorium treatment for one year prior to admission. Pneumothorax failed because of adhesions and he was referred to the University Hospital for thoracoplasty. There was daily sputum of 50 to 75 c.c. which was consistently positive for tubercle bacilli. A phrenic exeresis and a two-stage thoracoplasty were done. The large cavity initially present in the upper left lobe had completely disappeared. There is evidence of considerable new bone regeneration from the periosteum of the ribs in these recent films. The patient has no sputum, has gained 28 pounds in weight and has worked steadily for more than a year.

The patients are urged to lie on sandbags as soon as they can tolerate them after the operation. This measure helps to increase the collapse. Dr. Wangensteen felt that better collapse is obtained with thoracoplasty on the left side, owing to the presence of the incompressible liver on the right. Reports from the literature would also indicate that operations on the left side are better tolerated.

Dr. Wangensteen stated that only 13 phrenicectomies without other subsequent compressive operative procedures for tuberculosis had been done at the University Hospital. He felt that phrenicectomy alone had a rather limited value in the treatment of pulmonary tuberculosis. In a rather large number of patients upon whom thoracoplasty was done, an initial phrenic exersis had been done. When the diaphragm was fixed, the improvement resulting from paralyzing it is not likely to be great, even though it may rise somewhat into the chest. Dr. Wangensteen said that, during the two or three-year period since this service had been established at the University Hospital, thoracoplasty had been performed upon 50 patients, representing somewhat more than 100 thoracoplastic operations. In this group there had been two operative deaths; one was an acromegalic with a tuberculosis of long standing with an extremely rigid chest who stopped breathing while the incision was being made. Attempts to resuscitate her proved futile. The other patient had an asthma in addition, from which she was rarely free. Seven ribs were removed and it was hoped that one operative procedure would suffice. An unstable mediastinum and the asthma proved too severe a handicap for her. A graded procedure in this instance would have been much wiser. There had been in addition three hospital deaths, viz., one from amyloid disease remotely after a three-stage thoracoplasty; one by suicide, and one from miliary tuberculosis. Though thoracoplasty appears to be a rather formidable type of operation, Dr. Wangensteen said that it was surprisingly well tolerated by these patients in rather frail health. The postoperative reaction in women he said was less then in men, owing to the presence of smaller ribs and muscles. In the unilateral chronic non-exudative type of tuberculosis with cavitation in which pneumothorax was of no avail, Dr. Wangensteen stated that thoracoplasty succeeded in returning to health and usefulness a rather large number of patients who would otherwise be resigned to incapacity and a lingering death. Dr. Wangensteen said that there had been a few deaths in his group after the patients had left the hospital, but that the operations were too recent to discuss the end-results.

He stated that Professor Bull, of Oslo, had stated in his introductory address at the Seventh International Conference on Tuberculosis, held in Oslo last summer, that 401 patients had had thoracoplasty performed in Norway since 1914. Of a group of 328 patients operated upon more than two years previously, Professor Bull said that 37.5 per cent had been restored to full activity, 13.4 per cent were considerably improved, and 41.8 per cent were dead.

Case 15.—The next patient shown, a girl aged 29, had exhibited an interesting diagnostic problem when admitted to the University Hospital. In the latter part of 1929 she had become ill with cough and pain in the left chest. She had had two small hemoptyses but there had been no sputum. She had been admitted to a sanatorium for the treatment of tuberculosis, but it was decided after a thorough study that she did not have tuberculosis. When admitted here, about eight weeks ago, she complained of severe pain in the left chest and anorexia. She presented an anemic appearance and the hemoglobin was found to be 60 per cent. The fever was of the septic variety, ranging as high as 102 degrees. There was a firm brawny tender mass over the left chest wall involving the breast. There were no sinuses or fistulæ; the skin was a deep brown over the area of induration. An X-ray of the chest showed a mass within the chest as well; a lateral film showed it to be in the anterior portion of the chest. There was slight thickening along the margins of the ribs. Aspiration of the pleural cavity before admission had repeatedly been negative. A lipiodol filling of the bronchi was done and antero-posterior and lateral films were again made. The lung was apparently displaced into the posterior mediastinum by the mass. Two diagnostic impressions were entertained: (1) actinomycosis and (2) endothelioma of the pleura with invasion of the chest wall. It was believed that aspiration of the indurated area in the breast with a large needle and syringe suction would aid in the diagnosis by revealing either sulphur granules or small pieces of tissue which could be embedded in paraffin. After infiltrating the skin with novocaine, a large needle was pushed through the healthy skin beneath the breast and several cubic centimeters of sanguineous fluid was obtained in which scores of tiny sulphur bodies were present. The ray fungus was easily demonstrated by squeezing one of the sulphur bodies between a glass slide and a cover-slip in a drop of water. A paraffin block was made from the sediment and a large number of colonies were seen in the stained section. Dr. Wangensteen remarked that the tissue diagnosis of actinomycosis often established the diagnosis when the organisms could not be demonstrated in the fresh exudate. He said that the physician who makes the first puncture has the best chance to make the diagnosis and related that he had once aspirated a lesion in the cheek and observed the sulphur granules. The next morning when he repeated the procedure before his class he was chagrined in failing to demonstrate their presence. Decompression of the lesion permits the exudate to escape, after which the colonies of actinomyces are not easily demonstrated. In such cases when actinomycosis is suggested, Dr. Wangensteen felt that the tissue diagnosis should be depended upon.

A semilunar incision was made beneath the breast and the latter turned upward. Considerable seropurulent exudate came away, in which myriads of sulphur bodies were still present. The anterior segments of the third, fourth and fifth ribs were excised together with a portion of the pleura. The granulomatous type of tissue present was extremely vascular and there was considerable bleeding which was easily controlled by packing. Since the patient was operated upon there has been considerable reduction in fever and the pain in the left chest has disappeared. The appetite is good. The wound in the left chest has healed, but a lateral plate still shows the lung displaced posteriorly and Dr. Wangensteen felt that the patient should be re-operated upon in an attempt to excavate fairly completely the granulomatous tissue. The patient had been on large doses of iodides (5 to 10 grams daily). No X-ray treatment had been employed in this case. Dr. Wangensteen felt that radical excision, combined with the provision for escape of exudate by drainage, was the essential in the treatment. Two previous cases of thoracic actinomycosis that had extended from an uncontrolled cervical actinomycosis had proven refractory to X-ray and radium and both patients died.

The histories and X-ray films of two patients that had been treated for suppurative disease of the lung and pleura, but who proved to have carcinoma of the lung at autopsy, were briefly reviewed.

Case 16.—This patient was a man of 49 who had been ill with pneumonia in February, 1930. In May, he was operated upon for empyema and again in August. In October, 1930, he was admitted to the University Hospital with a weight loss of 70 pounds and an anemia (hemoglobin 60 per cent). There was considerable sputum and also drainage from a sinus in the left chest. An X-ray film demonstrated a dense shadow filling the entire left chest. There was relatively little drainage from the sinus in the chest compared with the amount of sputum. Bronchoscopy was negative. It was felt, therefore, that an abscess of the lung was the primary condition and an external drainage was performed just lateral to the heart. A carnified lung was found and pus obtained. The patient's condition imroved but he still continued to have fever and sweats. Ie also had some difficulty in swallowing. At a second peration about three weeks later an attempt was made o open up the old sinus in the chest more widely. As oon as the skin was incised there was a brisk venous emorrhage without apparent cause. For the first time t was suspected that the patient might have malignancy. 'his wound continued to bleed occasionally despite ather tight packing and the patient continued to fail nd died about three weeks after the last operative rocedure.

Autopsy showed a diffuse carcinoma of the entire ıng with encirclement of the lower esophagus. A ırge benign nephroma was also present in the left idney.

Case 17.—A man of 66 had been taken ill with cough nd fever in June, 1930. There was rusty sputum of bout a week's duration, after which there was sub- idence of the fever and the patient returned to work. Ie did not feel quite well all summer and lost a few ounds in weight despite a good appetite. In Septem- er he had periodic chills and fever and a slight un- roductive cough. In October, 1930, he was admitted the University Hospital. Examination showed a ırge man with some pallor and evidence of wasting. Iis temperature ran as high as 101° F. daily; physical xamination otherwise was essentially negative. X-ray xamination disclosed an almost perfectly spherical ıass about the size of a tennis ball to the right of the eart and in the anterior mediastinum as seen on the ıteral film. Bronchoscopic examination was negative. 'he contour and location of the homogeneously dense rea suggested very strongly a dermoid cyst. The ıass was definitely in the lung and was not thought be a circumscribed Hodgkin's of the lung. Because f the infectious features in the history it was felt best approach the lesion as though it were an encap- ılated empyema or an abscess. During the week that receded the operation the patient felt that he was aining rapidly. At operation, performed under local nesthesia, the anterior segments of the second, third, nd fourth ribs were removed. A free pleural space 'as encountered and an iodoform gauze pack was left n the pleura. A week later the wound was reopened, ıd the mass was needled through the pleura. Pus was btained and the pleura was incised and a drainage act was made into the lung with the endotherm knife. Vhen the mass was reached more exudate in which eces of tissue were clearly visible came away. It was bvious, therefore, that the lesion was a malignant ımor that had broken down. Microscopic examination f the tissue showed adenocarcinoma.

The next morning without warning or obvious cause ıe patient became suddenly extremely dyspneic. xygen afforded only slight relief. Shock quickly ıpervened and before the patient could be transfused expired.

Autopsy showed a large carcinoma of the hilum of ıe right lung with a large fist-sized tumor mass plug- ng the right atrium and extending through the mitral ılve into the left ventricle. The extension of the ımor by way of the pulmonary vein directly into the heart served as a satisfactory explanation for the sudden dyspnea and shock. The not infrequent complication of brain abscess in pulmonary suppuration of various types, Dr. Wangensteen said, had its explanation in this mode of spread. Such abscesses occur in the left cerebral hemisphere, he said, in about 75 per cent of instances.

Dr. Wangensteen commented on the difficulties of making an early diagnosis of carcinoma of the lung and on the several sources for confusion. He believed that there are no early symptoms on which the diagnosis can be made with assurance. Reliable bronchoscopic examination and X-ray films, together with a critical analysis of the history, he felt, were of most value. Unfortunately the treatment of carcinoma of the lung is as unsatisfactory as its recognition. Most primary carcinomas of the lung begin in the main bronchi; a lesser number start in the parenchyma. These latter tumors should be amenable to surgical excision (lobectomy) or destruction with the cautery. Professor Sauerbruch had obtained 3- to 5-year cures in the bronchi is early recognition by bronscopy and hope of dealing satisfactorily with the more numerous group of primary carcinomas of the lung that originate in the chonchi is early recognition by bronchoscopy and endoscopic treatment with radium and diathermy. Kernan, of New York City, Dr. Wangensteen said, has reported such a case in which the tumor completely disappeared under such treatment. The symptomatology, diagnosis, and treatment of carcinoma of the lung all need intensive study and clarification.

Dr. E. K. Green made a motion that a vote of thanks be given the Surgical Staff and Superintendent for the fine program which had been presented, and for the dinner preceding the program.

Dr. A. T. Mann said that personally he felt as though he had been at a rather full program of the Tri-State and also expressed the thanks of the Surgical Society.

Dr. Wangensteen replied that it had been a pleasure to have the opportunity of entertaining the Society in this way.

H. O. McPheeters, M.D.,
Secretary.

ZINC CHLORIDE IN CANCER

The use of zinc chloride and similar caustics in the treatment of cancer has been practically abandoned by all except the "cancer cure" quacks. Such caustics are difficult of control, so that there is destruction of healthy, as well as of malignant, tissue; their action is slow, thus unnecessarily prolonging the pain of removal. Much better results can be obtained by the judicious use of surgery when the growth is operable, or by the use of radium and roentgen rays when the disease has advanced beyond the chance of its complete removal. The use of such caustics has been abandoned also by the progressive dermatologists in the treatment of small epitheliomas of low malignancy; they use, instead, radium, roentgen rays, or coagulation with high frequency currents. (Jour. A. M. A., March 7, 1931, p. 797.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg.
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

MEDICINE

TUBERCULOSIS ABSTRACTS*

When as a young man Sir Robert Philip, now professor of tuberculosis in the University of Edinburgh, announced his intention of specializing in tuberculosis, one of his wisest and kindest teachers said, "Don't think of such a thing. Phthisis is worn to a very thin thread. The subject is exhausted." Fifty years of untiring labor and leadership have dimmed neither the zest nor the perceptions of this pioneer. Recently, Sir Robert delivered the Malcolm Morris Memorial Lecture on "The Outlook on Tuberculosis." After reviewing the past, he sounded the call for fresh orientation. Advanced disease of the lung, he said, has absorbed most of our interest in the past; it is time to shift attention more and more towards the earliest indications of tuberculosis infection. In this number of "Tuberculosis Abstracts," there is space only for comment on this phase of tuberculosis control. Sir Robert Philip's interesting and comprehensive monograph was published in the British Medical Journal of January 10, 1931.

Determining Earliest Indications of Infection

Pulmonary tuberculosis is in reality a late, visceral manifestation of an infection contracted much earlier. The author has had opportunity in numerous instances to trace the development of tuberculosis in the same subject in ever-changing form from the seed stage up to full fruition; in some instances, for 30 years or more. The ebb and flow—the arrest and advance of the disease—are but expressions of the continuing contest between the invading organism and the resistance of the tissues of its host. While the invading organism is presumably little changed save in respect of numbers, the resistance offered varies endlessly as a result of intercurrent illness; accident, strain, and a host of environmental influences. Infection is the crossing of the frontier—the beginning of what is often a lifetime contest.

SCIENTIFIC ANTICIPATION

The hope of preventing the endless possibilities of subsequent mischief following infection led the author some years ago to recommend the systematic examination of contacts. The next step was to advise the search for the earliest traces of tuberculous infection in every child. As infection takes place most commonly during childhood, the tuberculin test, he believed, should become routine practice at stated intervals from early infancy onward. So long as the reaction remains negative, nothing further is necessary. Whenever a positive reaction is obtained for the first time, the fact and the date should be recorded on the permanent medical history of the child.

If, after positive determination, the health of the child continues thoroughly good, we have the knowledge that the child's resistance is sufficient, and there is no call for treatment. On the other hand, the positive determination may illuminate many after-events. Vague conditions of "delicacy" in the child may find their explanation—for example, malnutrition, obscure feverish attacks, ill-defined lack of energy, so-called "disturbed action of the heart," which may interfere with the claims of education and sport. Such conditions are very frequently the expression of tuberculous infection. Further, the occurrence of incidental illnesses, such as measles and whooping-cough, will call for watchfulness, and care will be taken to secure complete convalescence after such attacks. The doctor will insist on the maintenance of a high level of resistance, more particularly in relation to school life, the period of adolescence, and the time of entrance into more responsible life.

---

*Reprinted from Tuberculosis Abstracts, a review for physicians issued monthly by the National Tuberculosis Association June, 1931, Vol. IV, Number 6.

DETERMINE THE FACT AND DATE

Preventive medicine may wisely take a lesson from the sphere of agriculture. The practical farmer who seeks to raise a tubercle-free herd has learned the value of the tuberculin test. A method for the early detection of tubercle which is worth the farmer's while on economic grounds has still greater significance and wider efficacy—both medically and economically—in dealing with the human race.

Sir Robert Philip would not make a formal distinction between reactors and non-reactors but recommends the routine practice of determining the *fact* and *date* of the initial infection in every child. That is a service which might well commend itself to the American physician, who is growing increasingly interested in preventive medicine and strives to render to his families a positive health service.—*The Outlook on Tuberculosis: Changing Orientation, Sir Robert Philip, The British Med. Jour., Jan. 10, 1931.*

PAPER STIMULATED WIDE INTEREST

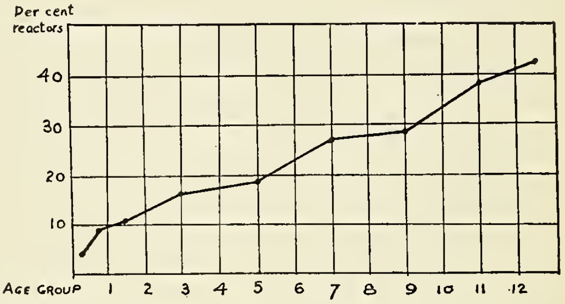
Sir Robert's paper immediately stimulated much discussion among the medical profession of England and Scotland. The comments were, on the whole, favorable, and reflected the deep respect which is felt by doctors and laymen for the genius and leadership of the author. To him, said one writer, is due almost entirely the present favorable position of the campaign against tuberculosis. The comments, together with Sir Robert's final rebuttal, were printed in subsequent issues of the *British Medical Journal.* Some of these are briefly abstracted below.

Robert Carswell raised this question: Supposing the fact and date of tuberculization has been duly noted in relation to each child; what practical use is now to be made of the information? Excluding specific methods of immunization or "detuberculization," Sir Robert Philip's answer, he says, is too nebulous. He believes that a more definite attempt should be made to immunize the child (presumably by some form of vaccination). In spite of many failures, there has been sufficient success with preventive immunization, supported by ordinary hygienic measures, to make it more than a hope, and he submits that demonstration to prove the value of detuberculization is the next most important step in the campaign against tuberculosis.

TEST A CLUE TO SOURCE OF INFECTION

John Gibbens takes issue with that part of the essay which implies that malnutrition, obscure feverish attacks, lack of energy, and the like may be the expression of tuberculous infection in a child who reacts positively to the tuberculin test. Tuberculosis carries with it too great a stigma to justify anyone in diagnosing it easily in such delicate children. The value of the positive Mantoux test, he says, lies rather in stimulating the doctor to get the child back to full health as rapidly as possible. Gibbens admits that knowledge of the fact of tuberculization is extremely important but for another reason; namely, that the earlier the age at which a positive reaction is found, the more likely is one to find the adult that is disseminating the infection.

W. Camac Wilkinson emphasized that the environment of the child is the source of infection. Too much attention cannot be paid to the environment of the child if we wish to tackle infection at its source. "Neither fresh air nor sunshine can prevent tuberculosis in children living in the houses of consumptive parents."—*The British Med. Jour., Jan. 24, 1931.*



Mantoux Reactions of 1,286 Children—Bellevue Hospital, New York, from 1921 to 1928. (From Tuberculin Skin Reactions, C. H. Smith, Am. Jour. Dis. of Children, Dec., 1929.)

Sir Robert Philip in his answer disclaims responsibility for misunderstandings voiced and reiterates that to the question, "Have we reached finality?" an emphatic negative must be given. He repeats his plea for the systematic search for, and determination of the fact and date of initial infection in every child, primarily so that the information may be kept in view throughout the further life-history of the individual in order that, if indications of progressive tuberculization supervene, they may timeously be met by measures of detuberculization.—*The British Med. Jour., Feb. 7, 1931.*

THE EFFECT OF LESSENED RESPIRATORY RESERVE ON BLOOD AND CIRCULATION: Willis S. Lemon (Arch. Int. Med., Vol. 45, No. 1). This study deals with the effects produced on the respiratory reserve by lessened mechanical efficiency, and an attempt to discover the point at which reserve is lost, at which respiration, as a function, is inadequate, and at which circulatory aid is required so that an animal can maintain a comfortable existence.

Avulsion of all intercostal nerves on left side of dog was performed ten days later; the same thing was done on right side. One week later, phrenic neurectomy was performed on right side. Five days after, a left phrenic neurectomy was performed. Breathing was now dependent on extra-respiratory muscles in neck and shoulders, and to muscles attached to ribs on the vertebral side of the operative sites.

The behavior of the dog was similar in respects to other dogs which were normal. It could not, however, respond to vigorous exercise with the same ease because the vital capacity was lessened. The animal was thus still capable of ordinary activities, and with the ability to develop a vital capacity in excess of tidal air requirements.

The introduction of phrenic neurectomy does not alter in any way the movement of the chest wall. Asymmetry and reduction of outward lateral movement occur when the intercostal nerves on one side are sectioned. The reduction of movement amounts to from 30 to 50 per cent of normal, depending on the number sectioned. Symmetry and bilateral reduction of movement result in bilateral section of the intercostal nerves.

The dog was allowed to live under normal conditions and surroundings for one year. He developed normally and did not experience any difficulty either in urination or defecation, despite paralysis of the whole diaphragm and of the upper abdominal muscles. The muscles of the lower abdomen underwent hypertrophy. Respiratory movements were normal, and he was dyspneic only after unusual exertion. He could run up and down stairs without embarrassment.

One year after the last previous operation, abdominal cavity was opened and diaphragm was resected from its ventral attachment. It was noted that whole diaphragm had taken a position high in the thorax and atrophy was so excessive that the muscular portion could not be distinguished from the tendinous portion, except with difficulty, and whole diaphragm so thin that lungs were plainly visible through it. The dog now learned to breath differently, the chest raised as one piece during inspiration, and at the same time the abdomen contracted strongly.

The three functions of the diaphragm—respiratory, pressure-producing, and partition-effecting—were almost completely destroyed.

Ten months later, the abdominal cavity was again opened. The stomach, duodenum, and all but two lobes of the liver had forced their way into the thorax. The diaphragm was detached from side to side, and backward as far as possible. After recovery from the operation, the dog was healthy and active and did not show any evidence of respiratory embarrassment.

The studies showed: 1. Vital capacity was lessened, but never beyond the point where it failed to be equivalent to tidal air. The ventilation in liters of air breathed each minute reached a high normal amount, but was not distinctly abnormal at any time.

2. The hemoglobin decreased from high to low normal percentages, but the normal amount of hemoglobin for each 100 c.c. of blood was within normal limits.

3. The number of erythrocytes failed to indicate either temporary or permanent erythrocytosis, such as might have been anticipated had respiratory competence been destroyed.

4. The arterial and venous oxygen content and the oxygen of the blood were essentially normal.

5. The heart remained normal functionally, and has not shown evidence of hypertrophy, and the electrocardiogram cannot be interpreted as evidence to indicate any definite failure of the right ventricle.

The experiment illustrates the degree to which muscular dysfunction may be carried before respiratory incompetence develops in an animal which has normal heart and lungs. It seems to confirm the independence of two fundamental functions having interrelated duties; great loss of reserve in one is required before demonstrable evidence of coöperative support is provided by the other.

E. T. Johnson.

NON-APICAL INFILTRATIONS IN PULMONARY TUBERCULOSIS. Karl Fischel (Amer. Rev. of Tuberc., 1931, XXIII, 139). To diagnose pulmonary tuberculosis in its earliest stages we must locate the lesion in many instances before symptoms appear and even before physical signs can be detected. The small centrally located focus may be active and spreading while the patient is apparently in good health. Assman was one of the first to report such foci in the infraclavicular area. Serial X-ray films make their identification possible. Redeker and others have shown that pulmonary tuberculosis usually begins in this manner and that tuberculosis limited to the apex is a comparatively late manfestation of the disease and is frequently evidence of a conflict already won while isolated lesions lower down have a much graver significance. Their views have been confirmed by various German, English and American writers.

Fischel discusses the relation of these lesions to Ranke's theory which recognizes three stages in tuberculosis. Ranke's primary complex is now generally known in this country as the primary or childhood type of tuberculosis and includes the primary Ghon lesion and the enlarged regional lymph glands which accompany it. It is predominantly a tuberculous lymph adeitis. This primary lesion of tuberculosis is accompanied by a profound, modification of all the tissues of the body (allergy) so that they are hypersensitive to the tubercle bacillus and its products.

Ranke's second stage begins with the first reinoculation of the allergic animal body. Inflammatory changes consisting of hyperemia, edema, emigration of leukocytes, etc., make up the anatomical picture of the focus of reinfection. The early non-apical infiltrations which Fischel considers the usual beginning of serious pulmonary tuberculosis in adults are accompanied by the inflammatory changes characteristic of a second infection with tubercle bacilli of tissues made hypersensitive by a previous infection somewhere in the body.

We are really dealing with an acute bronchopneumonia surrounded by an area of perifocal inflammation and in no way walled off from the surrounding tissue. It has free communication through the bronchi, blood vessels and lymphatics with other parts of the body. The fate of the patient at this critical period depends on the stabilization of his immunity. If he is not overwhelmed by his extrẽme hypersensitiveness, the lesion may quickly heal and disappear, providing the patient is given prompt treatment. In many cases if he becomes toxic and the lesion is apparently spreading rapidly, producing caseation and cavities, immediate pneumothorax will often turn the balance in the patient's favor and save his life.

Fischel believes the proper interpretation of the lesions found in so-called apical tuberculosis is that they are the late results of favorable cases. Fairly extensive subapical lesions have eventually involved the apices. Retrogression and healing have been slower there and changes may persist after the lesion below the clavicle or in the middle field have disappeared. As far as X-ray and physical signs are concerned, any lesion in the subclavicular region will tend to diminish the elasticity of the lung above.

The importance of frequent X-ray examinations of exposed individuals and the most prompt and careful hospital study of suspected cases are emphasized.

A. T. Laird.

CASES OF PULMONARY TUBERCULOSIS WITH EARLY CAVITY FORMATION AND FEW SYMPTOMS (Tuberculoses torpides cavitaires d' emble'e). E. Buc (Revue de la Tuberculose, 1930, X, 1096). "In certain cases one finds completely softened tubercles in the midst of crepitant lung tissue, and in these cases the walls of the cavities are smooth and seem to be formed only by lung tissue a little compressed or thickened but without any trace of a false membrane." So wrote Laennec, nearly a hundred years ago.

Buc states that cavities are not always the result of the breaking down of large caseous foci and claims that they may appear very quickly, even in a few days, at the very start of a rapidly developing tuberculosis; in fact they are often the first demonstrable lesions in cases that eventually become chronic. Without doubt from an anatomic point of view, the loss of substance is caused by the breaking down of a small caseous area, but this produces practically no clinical phenomena.

The cavity is almost always an unexpected discovery during an X-ray examination. As noted above, very few symptoms accompany its formation. There may be a persistent cough which annoys the patient or a small amount of sputum which is very viscid. Sometimes this expectoration is present at the very beginning; in other cases it is preceded by a few acute symptoms, a slight hemoptysis, or a febrile attack lasting a few days, or loss of weight and strength may be noted.

These symptoms are likewise often of very recent origin and have been present only a few weeks before the X-ray shows a cavity about which there can be no doubt, of considerable size. At this time the cavity is the principal lesion seen, it is isolated and solitary. The broncho-vascular trunks may appear thickened but the parenchyma appears practically normal. Consecutive films show the formation and increase in size of such cavities. At first their contours may be faint and indistinct, while the surrounding tissue is not much different from the normal lung. This is Jacquerod's first stage of cavity formation. In other cases although symptoms have lasted only a few weeks the cavity is already large, with definite borders and it is surrounded by an area of lessened density. One might think the cavity was much older than the history of the case would lead one to suppose. It is impossible to say from the film how long the cavity has existed, but there can be no doubt that it may appear without preceding consolidation of any great extent.

Outside of X-ray study, sputum examination is the most useful diagnostic procedure in these cases. The amount of sputum is usually very slight and patients may even say they do not expectorate; others will admit that they occasionally expectorate a small amount. Sometimes examination of feces will give positive results. When the cavity is present and enlarging, tubercle bacilli are usually found in spite of the paucity of symptoms. The syndrome really consists of three elements: X-ray evidence of cavity, positive sputum and comparatively good general condition. Cavities may persist unchanged even for an entire year or more. Increase in weight may mislead one as to the seriousness of the condition. The spontaneous disappearance of such cavities is much less rare than is the case with other cavities due to tuberculosis. Often no trace remains. Of twelve cases, six underwent spontaneous cure under sanatorium care. Symphisis of the pleura seems to occur rather frequently in cases with cavities of the type under consideration. Artificial pneumothorax and phrenicectomy are valuable when there is no tendency to spontaneous disappearance, but they are not employed until a period of observation of several months at the sanatorium has demonstrated that no such tendency is present. In suitable cases they are most valuable, as they are followed by rapid disappearance of tubercle bacilli from the sputum. This is very important, since often on account of the appearance of good health and freedom from symptoms these patients are very dangerous to those who live with them.

A. T. Laird.

PEDIATRICS

TUBERCULOSIS.. Allergic, anaphylactic and immune reactions in guinea pigs following inoculations with heat-killed tubercle bacilli. A. Branch and H. R. Cuff (Jour. Infect. Dis., 47:151, Aug., 1930). Branch and Cuff found injections of heat-killed virulent tubercle bacilli, when given in sufficient dosage and concentration by intraperitoneal, intrapleural, intratesticular or subcutaneous routes in guinea pigs, to set up a state of allergy in the inoculated animal, as evidenced by positive intracutaneous and testicular reactions to old tuberculin and by positive Pfeiffer phenomena when living virulent organisms are injected. The most rapid and intense reactions follow intratesticular inoculations. The least constant and slightest reaction is elicited by subcutaneous inoculations. Failure to develop allergy was noted following intracardiac, intravenous and intramuscular administration of doses of three to five mg. The development of allergy following injections of heat-killed virulent tubercule bacilli thus varies considerably, depending on where the dose is administered. Allergy may develop in fifteen days of inoculation with three mg. of heat-killed tubercle bacilli in the peritoneum or pleura, but in their experimental animals anaphylaxis did not appear until at least three weeks after the inoculations. They feel, therefore, that allergy and anaphylaxis are not directly related. Furthermore, allergy is a phenomenon distinct not only from immunity but also from anaphylaxis as shown by the fact that some intramuscularly inoculated guinea pigs that are non-allergic to old tuberculin, yet develop typical lethal shock when old tuberculin is inoculated directly into the blood stream; allergic guinea pigs may show anaphylaxis but not always.

In general Branch and Cuff conclude that allergy and anaphylaxis in tuberculosis are independent phenomena, and that immunity may be present without allergy. In addition intramuscular (and probably intravascular) injections of heat-killed tubercle bacilli produce immunity and anaphylaxis without allergy, whereas intraperitoneal, and intrapleural injections produce all three of the above conditions. They feel that the practicability of prophylactic immunization of children by intramuscular inoculations with heat-killed virulent bacilli is suggested, the advantage being that if immunity can be obtained without allergy, the valuable tuberculin skin test, if later positive, is evidence of reinfection and not the result of vaccination.

C. A. Stewart, M.D.

SURGERY

THE CONSERVATIVE TREATMENT OF PREPATELLAR BURSITIS. Louis Carp (Surg., Gynec. & Obstet., January, 1931, Vol. 52, pp. 87-91). Twenty-seven consecutive cases of acute or chronic prepatellar bursitis were studied to determine the end-results of conservative therapy. The technic consisted of evacuating the fluid as comppletely as possible and injecting 2 to 5 c.c. of 3.5% tincture of iodine into the bursa. The needle was withdrawn and the skin over the bursa massaged vigorously. The knee was placed in complete extension and a pressure bandage applied. In 60 per cent of the cases small amounts of fluid re-accumulated. Aspiration of this fluid was employed; a second injection of the tincture of iodine usually was not necessary. Twenty-four cases were followed an average of 16 months and showed no symptoms or reappearance of the bursal fluid.

Herbert A. Carlson, M.D.

NEW AND NON-OFFICIAL REMEDIES

TRUTH ABOUT MEDICINES

Pollen Extracts-Arlco.—The following pollen extracts-Arlco (New and Nonofficial Remedies, 1930, p. 29) have been accepted: Birch Mixture Pollen Extract-Arlco; Maple Mixture Pollen Extract-Arlco; Oak Mixture Pollen Extract-Arlco. Arlington Chemical Co., Yonkers, N. Y. (Jour. A. M. A., March 7, 1931, p. 773.)

Iopax.—Sodium 2 - oxo - 5 - iodopyridine - N - acetate, Iopax contains from 42 to 43.5 per cent iodine. It is proposed for use intravenously in radiographic visualization of the urinary tract. It is also used for injection into the renal pelvis through the ureteral catheter for pyelography. The maximum intravenous dose is 30 Gm. of the powder dissolved in 100 c.c. of redistilled water. Schering Corporation, New York. (Jour. A. M. A., March 14, 1931, p. 859.)

Nupercaine-Ciba.—a-butyloxycinchoninic acid, Υ-diethylethylenediamide hydrochloride. Nupercaine was first introduced as percaine. Nupercaine is a local anesthetic, acting like cocaine when applied to mucous surfaces and like procaine or cocaine when injected, the action being relatively prolonged. Nupercaine is about five times as toxic as cocaine when it is injected intravenously into animals, and its anesthetic activity is correspondingly greater than that of cocaine when it is applied to a mucous surface; it is many times more active than procaine hydrochloride when it is injected subcutaneously. It is reported to have caused necrosis of tissue in one case and a condition resembling gangrene with recovery in another. Death has been reported after the subcutaneous injection of 135 c.c. of a solution of 1 in 1,000. The usual precautions should be observed when it is injected into the spinal canal or into the urethra. Nupercaine is supplied in the form of crystals; ampules buffered solution 2 c.c., 1:200; ampules solution 5 c.c.; 1:1,000; solution 2 per cent, and tablets, 0.05 Gm. Ciba Company, Inc., New York. (Jour. A. M. A., March 21, 1931, p. 946.)

Schick Test.—A diphtheria immunity test (New and Non-official Remedies, 1930, p. 380) marketed in packages of one capillary tube containing undiluted diphtheria toxin standardized, sufficient for ten tests, accompanied by sterile diluent; in packages of one capillary tube containing undiluted diphtheria toxin standardized, sufficient for fifty tests, accompanied by sterile diluent; in packages of two capillary tubes containing undiluted diphtheria toxin standardized, sufficient for one hundred tests, accompanied by sterile diluent. As a means of control the Schick test control is supplied. National Drug Co., Philadelphia.

Ephedrine Hydrochloride-Gane and Ingram. — A brand of ephedrine hydrochloride-N.N.R. (New and Non-official Remedies, 1930, p. 168). Gane and Ingram, Inc., New York.

Ephedrine Sulphate-Gane and Ingram.—A brand of ephedrine sulphate-N.N.R. (New and Non-official Remedies, 1930, p. 170). Gane and Ingram, Inc., New York.

Tuberculin Old (Human).—Tuberculin-Koch (New and Non-official Remedies, 1930, p. 358) marketed in single 1 c.c. vial packages; also in packages of one 4 c.c. vial. National Drug Co., Philadelphia. (Jour. A. M. A., January 3, 1931, p. 39.)

Pollen Extracts-Cutter.—The following pollen extracts-Cutter (New and Non-official Remedies, 1930, p. 31) have been accepted: Oak Pollen Extract-Cutter; Western Ragweed Pollen Extract-Cutter; Western Water Hemp Pollen Extract-Cutter. Cutter Laboratory, Berkeley, Calif.

Winthrop Viosterol in Oil 250 D.—A brand of viosterol in oil 250 D-N.N.R. (New and Non-official Remedies, 1930, p. 410; Jour. A. M. A., October 4, 1930, p. 1021). Winthrop Chemical Co., Inc., New York. (Jour. A. M. A., January 24, 1931, p. 271.)

Tetanus Gas Gangrene Antitoxin (Lederle) Refined and Concentrated.—An anaërobic antitoxin (New and Non-official Remedies, 1930, p. 343) prepared by immunizing horses with gradually increasing doses of the toxins of *B. tetani, B. perfringens,* and Vibrion septique. The toxins are individually prepared. The product is marketed in packages of one syringe containing one prophylactic dose, stated to represent tetanus antitoxin 1,500 units, perfringens antitoxin 1,000 units and Vibrion septique antitoxin 10 units. Lederle Laboratories, Inc., Pearl River, N. Y.

Gas-Gangrene Antitoxin (Polyvalent) Refined and Concentrated, Without Tetanus Antitoxin.—An anaërobic antitoxin (New and Non-official Remedies, 1930, p. 343) prepared by immunizing horses with subcutaneous injections of gradually increased doses of the toxins of *B. perfringens,* Vibrion septique, *B. oedematiens, B. sordelli and B. histolyticus.* The toxins are individually prepared. The product is marketed in vials containing one minimum therapeutic dose, stated to represent perfringens antitoxin 10,000 units, Vibrion septique antitoxin 100 units, *B. oedematiens* antitoxin 200 units, *B. sordelli* antitoxin 200 units, and *B. histolyticus* antitoxin 25 units. Lederle Laboratories, Inc., Pearl River, N. Y.

Tablets Amytal, ¾ grain.—Each tablet contains amytal (Jour. A. M. A., October 18, 1930, p. 1178), ¾ grain. Eli Lilly & Co., Indianapolis.

Ampules Gold Sodium Thiosulphate-Abbott, 0.01 Gm.—Each ampule contains gold sodium thiosulphate-Abbott (Jour. A. M. A., December 20, 1930, p. 1913), 0.01 Gm. Abbott Laboratories, North Chicago, Ill.

Sulpharsphenamine-Metz, 0.75 Gm. Ampules.—Each ampule contains sulpharsphenamine-Metz (New and Non-official Remedies, 1930, p. 72), 0.75 Gm. H. A. Metz Laboratories, Inc., New York.

Sulpharsphenamine-Metz, 0.9 Gm. Ampules.—Each ampule contains sulpharsphenamine-Metz (New and Non-official Remedies, 1930, p. 72), 0.9 Gm. H. A. Metz Laboratories, Inc., New York.

Sulpharsphenamine-Metz, 3.0 Gm. Ampules.—Each ampule contains sulpharsphenamine-Metz (New and Non-official Remedies, 1930, p. 72), 3.0 Gm. H. A. Metz Laboratories, Inc., New York. (Jour. A. M. A., January 31, 1931, p. 357.)

Diphtheria Toxoid.—This product (New and Non-official Remedies, 1930, p. 365) is also marketed in packages of five immunization treatments, in packages of fifty immunization treatments. For the two dose method of treatment the following forms are marketed: packages of one immunization treatment; packages of five immunization treatments; packages of ten immunization treatments, consisting of one vial; packages of fifteen immunization treatments, consisting of one vial; packages of fifteen immunization treatments consisting of thirty vials; in packages of fifty immunization treatments, consisting of one hundred vials. The National Drug Co., Philadelphia.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

HEART DISEASE. Paul Dudley White, M.D., Instructor in Medicine, Harvard Medical School; physician, Massachusetts General Hospital, Boston. 931 pages. Illus. Price: $12.00. New York: The MacMillan Company, 1931.

FUNDAMENTALS OF DERMATOLOGY. Alfred Schalek, M.D. Professor of Dermatology and Syphilology, University of Nebraska, Rush College, etc. 247 pages. Illus. Price: $3.00. Cloth. Philadelphia: Lea & Febiger, 1931.

TREATMENT OF INJURY BY THE GENERAL PRACTITIONER. Clay Ray Murray, M.D., F.A.C.S. Assistant Professor of Surgery, College of Physicians and Surgeons, Columbia University, etc. 2 Vols. 412 pages. Illus. Price: $5.00, flexible binding. New York: Harper & Brothers, 1931.

HANDBOOK OF ANATOMY, BEING A COMPLETE COMPEND OF ANATOMY. James K. Young. Revised by George W. Miller. 7th rev. ed., with 154 engraving, some in colors. Philadelphia, F. A. Davis Co., 1930.

This book is leather bound and the printing is clear and large so that it is easily read. There are 426 pages and 154 diagrams and plates. The purpose of this book as stated in the preface is "to lighten the labor of the student of medicine," and I believe that the book accomplishes that purpose. The book is clear, brief, and concise. Tables and diagrams are utilized to fix the different systems in the student's mind. The book is complete in every department and because of its conciseness is a valuable reference book.

A. N. BESSESEN, JR., M.D.

CLINICAL ALLERGY, PARTICULARLY ASTHMA AND HAY FEVER: MECHANISM AND TREATMENT. Francis M. Rachemann, M.D. 588 Pages and 30 Illustrations. Price $10.50. New York: The MacMillan Co.

During the past fifteen years the increasing interest in the allergic diseases has resulted in the formation of clinics and special societies for its study and individuals have also recorded their numerous observations. From this work has come a vast amount of literature on the subject in all its phases, some of it controversial or contradictory but much of it fairly well proven at the present time and forming the foundation on which our present knowledge of allergic conditions rests.

In this monograph the author, with great patience and much hard work, has reviewed the entire literature and has interpreted it, without bias, in the light of his own clinical experience at the Massachusetts General Hospital. The subject matter is very well arranged, and ably and fully presented. The first half of the book, covering the phenomenon of hypersensitiveness, explains the various theories of its nature and origin recognized at the present time. There are several excellent chapters on vaccine therapy and the mechanism of the tuberculin test. The second half of the book is devoted to the diagnosis and treatment of the various allergic diseases, especially hay fever and asthma.

This monograph is without question the most complete, thorough and modern of the various works on allergy. Anyone interested in the subject will find in it much food for thought as well as many valuable suggestions for the diagnosis and treatment of conditions which are usually puzzling. The bibliography is most complete and valuable for reference purposes.

E. V. Kenefick, M.D.

MENTAL ASPECTS OF STAMMERING. C. S. Bluemel, M.A., M.D. Clinical Instructor in Neurology at the University of Colorado School of Medicine. Pages 152. Cloth. Price $2.50. Baltimore: The Williams and Wilkins Company, 1930.

This book, complete in itself, is in a way supplementary to the author's previous work, "Stammering and Cognate Defects of Speech" (G. E. Stechert and Company, New York and London, 1913). It is intended, primarily, for school use, but is also written for those stammerers who must train themselves.

The book is divided into two parts. The first, "Stammering—An Impediment of Thought," comprising the first four chapters, is given over to a brief consideration of the general characteristics of stammering and to the statement of the writer's theory that stammering is a phase of psychoneurosis in which the afflicted individual is confronted with a momentary break in the continuity of consciousness regarding more particularly the auditory component of verbal image, namely, "stammering is an impediment of thought and not an impediment of speech."

In part two, the remaining eight chapters, "Thought Training as the Basis of Speech Correction," the author discusses the principles of speech correction and their application to kindergarten children and grade-school children, and adults and high-school children. Bluemel feels that before any and every attempt at speech the pupil must "tranquilize his emotions, formulate his thought completely" and breathe correctly. The particular responsibilities of the instructor and of the parent are then given special consideration and the writer concludes the work proper with a word of advice to the student.

This book is clearly and concisely written throughout and is most logical and sincere. It is a work which well deserves the careful consideration of the older children and adults who stammer and the parents of children who present this problem, as well as that of physicians and educators who are intimately associated with such individuals.

Walter P. Gardner, M.D.

FOR SALE—Small rural hospital. All modern. Worth $25,000. Will sacrifice for $16,000. Instruments and equipment included. $5,000 cash. Balance time at 6 per cent. Address D-130, care Minnesota Medicine.

WANTED FOR IDEAL ST. PAUL LOCATION

Pediatrician, eye, ear, nose or throat or other practitioner in special line to share office with energetic general practitioner and long established very successful dentist. Over flourishing drug store at Grand and Snelling Avenues, across from Macalester College, one block from Summit Avenue. Owner will subdivide space about 17 x 20 in second story to suit tenant. This second story is just being built over drug store. Space offered leads off large reception room shared with general practitioner and dentist. No chiropractors or other irregulars in building. Call John Fitzgerald, Cedar 1952.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

WANTED—Position as physician's office assistant and clinic technician by experienced stenographer with technician's training. Call Dale 3593, or address D-135, care Minnesota Medicine.

EXPERIENCED LABORATORY TECHNICIAN wishes position in doctor's office or hospital. No objection to some office work. Address D-136, care Minnesota Medicine.

FOR SALE—Number of surgical instruments at reasonable price. Address Mrs. W. S. Leech, Roseau, Minn.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

Vol. XIV JULY, 1931 No. 7

RADIO AND QUACK MEDICAL PROPAGANDA*

H. A. Bellows
Vice President, Columbia Broadcasting System, Inc., and
President, Northwestern Broadcasting, Inc.
Minneapolis

IN addressing such a group as this I feel that any layman must necessarily apologize in advance for his inability to speak the language of his hearers. Regarding most phases of the subject about which I am going to talk to you, the advertising of patent medicines and quack remedies, you all know a great deal more than I do. The only phase of it on which I may be able to give you some information is the broadcasting one. In order to do this, I shall have to dig into another of the learned arts, with which I am only a little more familiar than I am with medicine: the law. Considering, then, that I am going to talk to you about certain applications of the law to medicine, and begin by saying that I know nothing of either subject, you can well see how thoroughly qualified I am to address you.

I want to begin by saying that I regard the use of radio broadcasting for propaganda in behalf of fake medicine as constituting one of the most serious perils which the public health of America has to face. There are now, in round numbers, fourteen million radio receiving sets in use in the United States, and it will not be long before this figure is up to twenty million. Now, the most important feature of practically every one of these receiving sets is that it is in use in the home. It is used by every member of the family. Babies unable to walk are taught to crawl to the radio set and turn it on; Great-Grandpa, after he has ceased to be useful for any other purpose, can still play with the dial.

Another important thing to note is the general decrease in the price of receiving sets. There was a time when radio reception showed a certain amount of selectivity for the reason that receiving sets cost enough so that a great many homes could not afford them. Now, however, commercial sets are available at prices which put them within the reach of almost everybody.

All this means that radio today has a total circulation infinitely greater than that of any other single medium of communication. A program on either one of the two great national chains can reach practically every one of these fourteen million receiving sets. Compare this figure with the circulation of, say, three million claimed by the largest of our periodicals, or with the several hundred thousand of a metropolitan newspaper, and you can readily see the tremendous potential importance of radio as a medium of publicity.

Nor is this all. I do not need to tell you how much more effective an appeal can be made to the ear through speech than to the eye through the printed page. To begin with, there are enormous numbers of people to whom reading is an effort. Their minds respond with difficulty, if at all, to what they see in print. These are the classes of people who are most likely to be influenced by unsubstantiated claims for medicines and alleged cures. They are credulous, gullible and the victims of unfulfilled hopes.

Another thing to consider is the curious authority which radio enjoys with the great mass of its listeners. This comes, I think, largely from the element of magic which enters into our feelings about anything we do not understand. The newspaper reader, although he cannot tell you accurately how the paper is printed, has flattened his nose against the windows of a printing establishment long enough to have a vivid picture of how the presses revolve. The newsboy who delivers the paper at his door is a familiar urchin, probably his next door neighbor's son.

---

*Presented before the annual conference of secretaries of the component societies of the Minnesota State Medical Association, Saint Paul, February 7, 1931.

There is no magic in any of this. But when he goes to a little wooden box and turns a switch, speech and music come to him out of nowhere. It is small wonder that he does not know what is happening, because the greatest engineers are only a little better informed on the subject than he is.

After all, there is a good deal of magic about radio, and the messages that come over the air have very definitely a peculiar significance. People tend to believe in them because of the manner in which they come.

This is clearly shown by the way in which such broadcast statements produce action. In general, we all complain that we write and speak and work without producing any particular results. People may listen to us, or watch us, or read what we write, but as a general thing they promptly proceed to forget all about it. Not so with radio.

I have gone into so much detail in order to make you realize what I am pretty sure you understand already: the tremendous potential power of radio broadcasting. I want to make it plain that this power is very much greater than would be indicated by the actual number of receiving sets, great as that number is. It is a power which combines vast circulation with the effectiveness of a medium appealing to all classes of people, and appealing with particular force to that class of people whose judgment has not been trained by education. In other words, it is a particularly fertile field for the quack medicine advertiser.

This brings me straight to the question of the commercial status of broadcasting. First of all, I want to make it plain that, taken as a whole, broadcasting has not as yet made any money. It is perfectly true that the volume of radio advertising has enormously increased, particularly in the past two years, but it is equally true that the cost of operation has fully kept pace with revenue. This has been largely because of the need of new capital expenditure. Radio communication is so new, and is developing so fast, that equipment becomes obsolete almost before it is installed. There is hardly a first class radio station in the country that is using today the same studios of which it was so proud five years ago. Transmitters have either been completely rebuilt or are on the way to the scrapheap to make way for newer and vastly more expensive ones. When, in 1925, WCCO began operating its 5,000 watt transmitter, it was the last word in broadcasting construction, and everybody called it a "super-power" station. Today we are completing plans for the construction of a 50,000 watt transmitter, ten times as powerful as the old one, and nearly ten times as expensive.

Another thing I want to try and make clear is that the ownership and operation of a broadcasting station is not in itself a particularly good advertisement for the owning and operating company. There is a very close analogy in this between broadcasting and the newspaper business. For example, it presumably pays the Northern Pacific Railroad to advertise in the *Saint Paul Dispatch,* but it presumably would not pay the railroad to own the *Saint Paul Dispatch.* Exactly the same thing is true in radio. When, for example, Washburn Crosby Company, now General Mills, Incorporated, built the present WCCO, the Company believed that the ownership and operation of the station would help to sell Gold Medal Flour. I very much doubt if it has done so to any marked extent. On the other hand, General Mills is thoroughly convinced of the value of radio advertising. It actually accomplishes more in the promotion of sales by a single half-hour program once a week over WCCO than it did through all the announcements of its ownership of the station in the days when WCCO was actually owned and operated by Washburn Crosby Company.

What this means is that there is no longer any hope that broadcasting stations can be operated, as they were in the beginning, simply as publicity agents for their owners. For a long time it looked as if the stations owned and operated by newspapers might be exceptions to the general rule. The newspaper stations were, as a class, the last ones to go into the business of selling time, but even with these stations the owners found that any definitely traceable good which their companies were deriving from the ownership and operation of the station was nowhere near as much as could be purchased spending the same amount of money another way. In other words, it is far more effective advertising to put a commercial radio program on forty different stations than it is to put forty of your own programs on one station.

With our whole structure of radio broadcasting based on the use of radio for advertising, and with broadcasting stations as a whole just about breaking even, particularly in view of the evident necessity of heavy capital expenditure within the next few years, it is perfectly obvious that there is a good deal of a scramble for business. And because, for the reasons I have already given, radio is a peculiarly effective medium for alleged medical advertising, the manufacturers of patent medicine, and the sponsors of so-called "cures," have been among the foremost to try and purchase time. The number of these prospective clients for broadcasting, and also their persistence, are growing steadily. Not a day passes without bringing to WCCO one or more orders from patent medicine manufacturers, all of which, of course, are promptly turned down. So far as immediate returns go, I suppose our policy in this matter has cost us easily a hundred thousand dollars in the past twelve months. I do not in the least regret the position we have taken, because I believe that the general standing of a broadcasting station in its community is in the long run infinitely more important than its immediate profit, but I want to make you see why so many stations have yielded to temptation.

Of course the real question is: What are we all going to do about it? In order to give you the background, I have to discuss for a few minutes the special laws under which broadcasting operates. As many of you know, I was one of the original members of the Federal Radio Commission, and through my work in Washington, and also as chairman for the past three years of the Legislative Committee of the National Association of Broadcasters, I have had occasion to study the radio laws pretty carefully.

First of all, broadcasting has been definitely held to be interstate commerce. The whole structure of our radio law is based on the power given to Congress by the interstate commerce clause of the Constitution, and the courts have upheld this view without qualification. In one instance a case was brought by a little station which attempted to deny the authority of the federal government on the ground that the station could not possibly be heard outside the limits of its own state, and that therefore its regulation was purely a state matter. The court, however, held that even in this case the possibilities of interference crossed the state line, and that all broadcasting was therefore to be considered as interstate commerce.

This means that there is practically no hope of any effective regulation of radio broadcasting through state legislation. One or two states have actually tried to pass radio laws of their own, but in every case, so far as I know, these laws have been found unconstitutional by the courts just as soon as they varied in any respect from the federal law. Any attempt to put a curb on the activity of any radio station through state legislation is practically certain to result in failure, for the simple reason that the state courts simply will not accept jurisdiction.

Now let us see what the Federal law provides. The Radio Act of 1927 makes it mandatory upon the licensing authority, which is the Federal Radio Commission, to issue a license to any station if it can be shown "that public interest, convenience or necessity will be served thereby." Now, nobody knows what "public interest, convenience or necessity" actually means. The phrase has never been fully defined by the courts, and probably never can be defined by anybody.

Any radio station can make a convincing showing that the public is interested in its operation. The redoubtable Mr. Henderson, whom some of you may have heard, brought to Washington several huge bales full of signed affidavits from listeners to the effect that his station was the best on the air. I remember a little 10 watt station down in Iowa, the existence of which seemed to me a doubtful blessing. I asked the owner of it if he thought he was really doing anybody any good by running his station. He undertook to show me, and he did so by producing, in about a week, over ten thousand letters from listeners telling him how much they enjoyed his programs.

Furthermore, the radio law as it now stands does not give the Federal Radio Commission authority to revoke a license as a method of punishment, though an amendment giving this authority has just been introduced. Violations of law by a radio station are subject to punishment by fine or imprisonment, and action has to be taken through the Federal District Attorney. This explains why certain radio stations which have conspicuously violated the law, or which have been operated in clear violation of public decency, are still enjoying licenses from the Commission; the poor old Commission simply has not the power to revoke their licenses unless it can affirmatively prove that their operation is not "in the public interest, convenience or necessity."

There is one more provision of the Radio Act which is important in this connection. It is specifically provided that "nothing in this Act shall be understood or construed to give the licensing authority the power of censorship over the radio communication or signal transmitted by any radio station, and no regulation or condition shall be promulgated or fixed by the licensing authority which shall interfere with the right of free speech by means of radio communication." If you will stop and think of this clause for a moment, you will see that it practically deprives the Federal Radio Commission of any power whatsoever in putting a stop to misleading or fraudulent statements made over the broadcasting stations which it licenses. Congress was so anxious to restrict the power of the Radio Commission to the purely technical side of its work that it took away all power of controlling the use to which its licenses might be put.

With the law in its present state, I think it is useless to look to the Federal Radio Commission for any direct action in checking or restricting the broadcasting of quack medical advertising. There is, indeed, one rather clumsy piece of machinery which can be set in motion. If the Federal Trade Commission certifies to the Radio Commission that a station is being used for fraudulent or untruthful advertising, the Radio Commission can officially take cognizance of the fact, but only to the extent of telling the station owner that the particular piece of radio advertising complained of must be modified or discontinued. Considering the fact that it takes a long time to get the Federal Trade Commission to act, and that even after it has acted the remedy is so lamentably inadequate, I cannot say that this method of trying to remedy existing conditions is very useful.

So far as the Federal laws applying particularly to radio are concerned, the only hope I can see is in the possibility of an amendment by Congress to the Radio Act. You know far better than I do the difficulties of preparing such an amendment. I believe, however, that it might be possible to draft a general clause, making it illegal to broadcast any fraudulent statement of fact, or any statement which the station owner or the advertiser knows to be untrue. Such a clause is at best very difficult to manage, because it involves specific proof of fraud, but such an amendment, if carefully drafted with the approval of the entire medical profession, would certainly help the Federal Radio Commission by giving it much needed authority and might be of real service in some cases of patent medicine advertising.

Frankly, however, I have not much faith in the power of legislation to curb this type of advertising. I do not believe that a law can be drafted which will not have a lot of holes in it, nor do I believe that the enforcement of such a law would be much more effective than the enforcement of certain other laws which I have heard mentioned. I believe, therefore, that the best way to guard against the danger is through the use of existing laws covering slander and false statements, and above all through direct application to the broadcasters themselves.

As regards existing laws, the main trouble in applying them to broadcasting is to establish a clear proof of what is actually being said. For example, I was at one time involved in a very important case between two stations, one of which was sending out a tremendous amount of fake medical advertising. We had public stenographers make transcripts of these advertising announcements, but we found that these transcripts, although presented in the form of affidavits, were not acceptable to the court. It was not until we took dictaphone records of the programs of the station in question, including the objectionable advertising, and then produced the dictaphone record man himself in court to testify regarding the whole proceedings, that we were able to get the information in such form as to be effective.

There have been, however, a few cases in which stenographic transcripts of what has been said over the air have been adequate as evidence. One station in Iowa may soon, I hope, be compelled to discontinue a series of talks advertising an alleged cure for cancer as the result of stenographic records brought into court. This method may prove effective in the most acute cases, but it is available only when the statements are of a very extreme kind, and I do not believe it can accomplish much in preventing the ordinary run of patent medicine advertising.

By far the most effective way to stop this kind of advertising is directly through the pocketbook of the station owner. Radio advertisers are, as a rule, inclined to be very particular as to the company they keep. Before an advertiser signs a contract he is sure to ask what program will come just ahead of his own, and what one will follow. This is natural, because radio advertising is so largely dependent on creating good will among the listeners. The circulation of a broadcasting station depends solely on the number of people who want to listen to it, and once a station becomes thoroughly offensive to a particular class of listeners, it can count them definitely out of its audience.

Now, if a station advertises patent medicine, it is not a particularly good advertising medium for clients of a more respectable sort. And there is one thing about the patent medicine advertisers that makes them, as a class, undesirable clients for even the least scrupulous broadcasting station. Practically all of them want to broadcast simply short announcements. Almost never do they want to put on real programs. They like to tell their story in a hundred-word announcement every day, or at most, a five minute talk.

Now, what the radio station wants is the advertiser who will buy at least half an hour of time and pay for a real program. If such an advertiser says to the station owner that, although he would like to use his station, he really cannot bring himself to do so because of the number of objectionable patent medicine advertisements, the broadcaster is going to do some heavy thinking. He cannot afford to lose the good advertiser who wants to put on real programs, and he is going to do everything he can to take care of him.

More and more, I believe, reputable advertisers are going to refuse to buy time on stations which accept objectionable medical advertising. Of course there are always going to be certain stations which will depend on undesirable advertising for their main revenue, just as there are publications that do exactly the same thing, but if we can keep objectionable medical advertising off of all the larger stations, the amount of harm which can be done will be very materially cut down.

More important still is the direct appeal to the broadcasters themselves. The National Association of Broadcasters has adopted a fairly definite policy in this respect, but like all trade associations, its power over its individual members is relatively weak. I believe that the best thing the American Medical Association could do would be to approach the National Association of Broadcasters with a definite proposal for a regulation to be adopted by the association of broadcasters and sent to all members. Then it would be up to the various state medical associations to keep in touch with the individual stations and see that they live up to this regulation. Speaking as one of the directors of the National Association of Broadcasters, I can pledge the whole-hearted support of that organization to any such movement, and I believe the first step should be taken by the medical association.

With WCCO, we have a very satisfactory working arrangement with the Minnesota State Medical Association, which has given us constant and splendid coöperation. Under the terms of our agreement with the Association, we refuse to broadcast any medical advertisement or talk unless it is specifically approved in advance by the State Medical Association. This, of course, means that no such material ever gets on the air from WCCO.

After all, broadcasting, which can be carried on only by virtue of a Federal license, in other words, a license from the people, is to some degree a matter of public service. This is recognized in the vague language of the Radio Act, "public interest, convenience or necessity." It is manifestly not in the public interest that the privilege granted by a Federal license should be used in such a way as to endanger the public health. If it is persistently so used, Congress will have to find a way to stop it. I believe, however, that before this happens, the broadcasters will see the wisdom of putting a stop to it themselves. Some of them understand the situation already, but a great many others will understand it only if the facts are brought to their attention in direct relation to the inevitable consequences to their pocketbooks. Just as soon as a broadcaster can be made to see that his desirable advertisers will leave him, or desirable prospects will not sign contracts, if he persists in broadcasting objectionable medical advertising, he is either going to discontinue the offensive advertising or is going to relegate himself to the class which has very few listeners. I believe the time has come for concerted action in this direction through the combined efforts of the American Medical Association and the National Association of Broadcasters, with the clear understanding that whatever is done must be followed up thoroughly and energetically by the state medical associations. I am convinced that such action will produce very desirable results, but if it should fail, there is nothing for it but to go to Congress and insist on the passage of additional legislation to prevent the use of a public license to the injury of the public health.

SKETCH OF THE EARLY HISTORY OF THE AMERICAN MEDICAL ASSOCIATION*

E. Starr Judd, M.D.
Rochester, Minnesota

THE origin of the American Medical Association can be traced to a national convention of delegates from medical societies and colleges called by the Medical Society of the State of New York. This meeting was called for the purpose of raising the standards of medical education. This first national medical convention met at the New York University May 5, 1846. After much opposition and indignation this session continued the making and discussing of resolutions all of which were to be referred to committees to be reported back to a meeting in Philadelphia the following year.

The national convention composed of nearly 250 delegates met in Philadelphia May 5, 1847, and resolved itself into the first session of the American Medical Association. According to the historians, in this meeting of three days' duration, work was outlined which was to occupy the society for the next fifty years. All through the historical articles repeated mention is made of raising the standards of medical education. A code of ethics was established. A constitution was adopted which encouraged the formation of state and county societies. The person who deserves more credit than any other for the beginning of this great medical organization is Nathan Smith Davis. For more than sixty years Dr. Davis worked for the highest ideal in medical education, organization, and journalism. He joined the faculty of Rush Medical College in Chicago, in 1849, and, in order to work out his own educational ideas, later founded the Chicago Medical College, of which he was dean for more than forty years. His name also appears among the founders of the Illinois State Medical Society, Chicago Medical Society, Mercy Hospital, Academy of Sciences, and Northwestern University. Dr. Davis was the first editor of the *Journal of the American Medical Association.*

In these early days, there was much discussion about higher standards of medical education. At that time the annual courses of many of the medical schools occupied only four months, and the curriculum was very inadequate. In these early years a great deal was said about preliminary education. Discussion brought out the fact that medical colleges were resentful of any attempt at regulation and each one feared to raise its own standards lest some other college in some other state would offer a more attractive bargain to the prospective student.

In 1848 authorities of colleges opposed the very modest requirements in preliminary education which had been suggested, and also opposed the extension of the term of lectures to occupy six months, because, as they said, such standards would impose unnecessary burdens on the student and deter many from studying medicine. The practitioners however favored anything that made it more difficult for medical graduates to multiply.

For many years after the American Medical Association was organized, there was much discussion as to who was entitled to membership in it. The original intention was to limit representation to state societies in regions where such organizations existed; local societies would be represented only if there was no state organization in the same region. Medical colleges, hospitals, asylums, and so forth, had representatives in the original organization.

Nathaniel Chapman was elected first president of the American Medical Association; although he had not been active in its organization, he was nevertheless one of the oldest and most eminent teachers of his time, and stood at the head of the profession. Evidently he was not very enthusiastic about the medical profession at that time, for in his presidential address he observed that the profession to which he belonged, "once venerated, has become corrupt and degenerated to the forfeiture of its social position and, with it, of the homage it formerly received."

At the meeting in 1848, Oliver Wendell Holmes urged American physicians to produce their own literature instead of republishing European works.

In 1850, for the first time, the American Medical Association held its meeting in a western city, in Cincinnati, and it is said that this meeting gave new and strong impulse to the work of organization throughout the profession in the western states. All previous regulations on medical education were reaffirmed.

---

*Presented before the annual conference of secretaries of the component societies of the Minnesota State Medical Association, Saint Paul, February 7, 1931.

The social organization was still more active at the meeting in 1851, in Charleston, S. C. Entertainment of the delegates was featured by a trip by steamboat up the river, to visit a rice plantation, and by an elegant and costly public dinner at which the historian, who was always an ardent teetotaler, "regrets to report that for the first time in the history of the association wines and strong drinks, which beguile the unwary and intoxicate the brain, were freely furnished." Three years later, after a still more elaborate entertainment had been provided by the members of the profession in New York, a resolution was adopted recommending to all future committees that they dispense with all costly and extravagant entertainments. At the meeting in Charleston, for the first time, steps were taken to form a separate section for the reception and discussion of original scientific papers, which up to this time had been given very little attention on account of the urgency of matters concerning policy and organization.

In 1852 it was recommended that no medical college should send delegates to the Association: (1) unless it have six members on its faculty, (2) unless it give one course of instruction annually of not less than sixteen weeks in the fundamental sciences, and surgery and midwifery, and (3) unless it requires its candidates for graduation to be twenty-one years of age, to have studied three years with some respectable practitioner, to have attended two full courses of lectures, not in the same year, and to have shown by examination that they were qualified to practice. In these years, the Association had no means of enforcement of its rules and in many ways progress seemed very slow.

In the early part of the Civil War there were no meetings, but in 1863 the Committee on Medical Education reported that reproach and distrust of the medical profession was felt everywhere, and that the chief cause of weakness of the medical profession was lack of preliminary education.

Attendance at meetings continued to grow larger and the work became more complicated, so that questions that arose often could not be decided in open meeting. Therefore in 1873 a judicial council of twenty-one members was created to take charge of and decide all questions of ethical or judicial character that might arise.

At the meeting in 1874 a plan of organization was discussed but it seemed impossible to get properly accredited delegates to take the time to do the work and make the decisions, and it was not until eight years later, at the meeting in Saint Paul, that effective steps were taken toward this end.

Up to 1882 the scientific papers had been published in the annual transactions and were essentially buried there. The annual membership dues at this time were $3.00 and the income to the Association varied from $2,000 to $6,000. The American Medical Association at this time was described as an organization without funds, without a definite permanent membership, which held an annual mass meeting of delegates from various societies, often with no mutual bonds.

At the meeting in Saint Paul in 1882 it was estimated that the publication of a journal would require $15,000 annually. It was decided to open the membership to all members of state and county societies, to increase the dues to $5 annually, to secure a charter, to appoint a board of nine trustees, and to establish a weekly journal. In July, 1883, the first number of the *Journal of the American Medical Association* appeared. In 1897 the Association was incorporated in the State of Illinois.

The publication of the journal was of the greatest importance, but the organization was becoming so large and unwieldly that many difficulties arose at each meeting. There seemed to be no way of marshalling so huge a membership for the organization and conduct of affairs. Many attempts were made to reorganize, and a committee which was appointed in 1886 had attempted for years to get action on its report, which was finally laid on the table. In 1900 a committee consisting of Doctors McCormack, Foshay and Simmons again began working on a plan for revision of the constitution and by-laws. The outstanding feature of the new plan was the proposal that a Business Section should be constituted to be known as the House of Delegates, the membership of which was not to exceed 150, the members to be elected by the state societies only. From this time the association has remained an absolutely democratic organization.

William H. Welch, at the close of his presidential address before the Association in 1910, said: "Among the organized forces for advancing the prosperity, the happiness, and the well being of the people of this country, the American Medical Association has an important part to play. We are justified in the confidence that, with the united support and loyalty of the profession, this association, broadly representative and standing for the best ideals of medical science and art and for professional and civic righteousness, will contribute a beneficent share to the working out of our national destiny."

Meetings held in 1882 and in 1901 were important from the standpoint of completing the organization of the national society.

The convocation held in 1901 at the Ryan Hotel in Saint Paul marked the reorganization of the American Medical Association. John F. Fulton was chairman of the local committee on arrangements.

A. W. Abbott of Minneapolis was the first delegate from the Minnesota State Medical Association to the House of Delegates of the American Medical Association.

Both the meeting held in 1882 and the one in 1901 were held in Saint Paul.

THE CENSORSHIP OF MEDICAL AND DENTAL ADVERTISING

One of the primary reasons for the establishment of the Council on Pharmacy and Chemistry of the American Medical Association in 1905 was the desire of the editor of The Journal of the American Medical Association for scientific advice concerning claims made by advertisers for proprietary remedies. The Board of Trustees of the American Medical Association give the fullest support to the Council by refusing space in the advertising pages of publications of the American Medical Association to advertisers of proprietary remedies who failed to meet the Council's requirements. With that support the Council has made its work and its name respected. The advertising pages of the publications of the American Medical Association and of the state medical journals that coöperate afford a striking contrast to the pages of the *British Medical Journal* and of the *Lancet* (London), which exercise a so-called censorship without, however, having behind the censorship the type of scientific study and control represented by the Council on Pharmacy and Chemistry. The Council on Dental Therapeutics of the American Dental Association began its work with high ideals and with enthusiasm. In 1930 the trustees of the American Dental Association adopted a resolution to place the association squarely behind the Dental Council in its efforts. Then, at the midwinter session of this association, held in February, 1931, the board of trustees practically reversed its previous action, placing the business manager of the periodical in a position of judgment over the council and making him arbiter as to whether or not the criticisms of the council shall be referred to the manufacturer. Without the power of the trustees of the American Dental Association and the periodical of the association wholeheartedly behind its work, the Council on Dental Therapeutics will be ineffective. (Jour. A. M. A., May 16, 1931, p. 1697.)

EXPERIENCES IN COUNTY MEDICAL ORGANIZATION*

THEODORE WIPRUD
Executive Secretary, The Medical Society of Milwaukee County
Milwaukee, Wisconsin

WHEN your genial Secretary, Dr. Meyerding, visited Milwaukee a few weeks ago and spoke to me about coming to St. Paul, he gave me explicit instructions as to what I should talk about. Among other things he wished me to emphasize our experiences in county medical organization and asked that I theorize as little as possible. I am afraid that Dr. Meyerding takes the same view of a discussion of medical organization that the scientist did of the law of gravity, when he said that a man who fell over a cliff did not break the law of gravity, he illustrated it. Dr. Meyerding evidently feels that illustration is more effective than theory. True as this may be, I will have to deviate a little from his expressed wishes. It is important, it seems to me, that we have a little background for a discussion of what we have been attempting to do in Milwaukee.

The growing importance of the county medical society has become increasingly evident. I was particularly impressed with this at the last session of the American Medical Association at Detroit because it seemed that every official who spoke, from the President down, emphasized that the county medical society was the most important cog in organized medicine.

Problems confronting medicine have become so complex and varied that it is small wonder that leaders in medicine are stunned by their magnitude. For any single organization or institution to give thorough consideration to modern medical problems in all their phases would be a practical impossibility. The American Medical Association does not presume to do such a thing, and perhaps wisely suggests that many problems are so interwoven with the social and economic fabric of our country that they cannot be isolated. There is, undoubtedly, a large measure of truth in this, but it is also true that the smallest unit of the American Medical Association—the county medical society—has it within its power to meet many local problems which in a large measure make up the major difficulties. Conditions vary greatly in various sections of the country. What would be a solution for public health problems in Milwaukee might raise havoc in Cleveland. A program that would be approved in St. Paul wouldn't necessarily be acceptable to Minneapolis. It is evident then that the county medical society, which we may say is on the fighting line of medical practice, will undoubtedly have a great deal to do with the solution of many medical problems, and that no light responsibility rests on this unit of organized medicine.

To meet the demands which are made upon it the county medical society must be organized. This does not mean the loosely organized unit which has become so familiar, where infrequent scientific meetings comprise the sole activity. It means a unit that will not only improve its members scientifically, but will also assume its responsibility in other directions, not least of all to the community. To do this effectively a full-time secretary or a member who can give a large portion of his time to Society activities is needed. In large centers a part-time secretary has a thankless and difficult job. He cannot possibly do justice to the job entrusted to him and still give adequate attention to his practice.

In the last few years a number of societies have employed laymen as full-time secretaries. At the present time there are twelve or thirteen large cities where laymen are entrusted with the executive work. So far as I have been able to determine, these laymen have been successful, and the societies employing them are satisfied with the work carried on. Outstanding work has been done in Cleveland, Detroit, New York, Toledo, and other cities.

I have sensed some opposition to laymen as officers of medical societies; undoubtedly, there are legitimate reasons for this attitude. The objection may be raised that the layman's background is not such that he can get the medical man's point of view. And then, of course, he does not have medical training, and therefore cannot understand the more important phases of the practice of medicine. In view of these shortcomings, it is contended he cannot make the proper approach to the most important functions of a county medical society.

---

*Talk given before the annual conference of secretaries of the component societies of the Minnesota State Medical Association, St. Paul, February 7, 1931.

On the other hand, there are many who feel that a layman can soon acquire a proper background for medical organization if he is intelligent and adapted to the work. The lay secretary, they feel, has many advantages over a physician in a similar position. He can approach problems which the physician would find extremely difficult if not impossible to handle. No one can contend that he is seeking prestige or that he has "an axe to grind." He views the problems of the organization from a fresh point of view, and, if he is wise, will discharge his duties after careful thought and counsel with able medical men of his society. In approaching community problems he is particularly well fitted, and can speak for the physician as the physician could not speak for himself. As the business manager of the society he should be much superior to the physician.

It would be presumptuous of me to draw any conclusions from these points of view. Whatever the reaction is the layman will undoubtedly play an important part in medical activity in the future. If he is conscientious and able, the thinking medical man will give him the credit that is due him.

Some years ago Herbert Quick wrote a book. He called it "One Man's Life." I thought it a mighty good title for autobiography. In relating a little of my personal experience that title occurs to me as applicable. You will, of course, overlook my personal references, knowing that Dr. Meyerding is responsible for my making them. He wishes you to have a look at the background for the work which one executive officer of a county medical society is doing.

Most of the laymen who have become identified with medical organizations were either newspapermen or lawyers. I was neither. For a number of years I was in the banking business. That sounds a lot better than it is, as any young banker will tell you. While serving as cashier of a bank in Northern Wisconsin I was urged by two physicians to join their hospital as business manager. Although skeptical I joined them, and became intensely interested in their work, serving in every capacity that I could. In the course of some eight years with these men, I learned much about physicians and their problems, which is now standing me in good stead. We enjoyed the satisfaction of building up an institution in that small community, which was unique and which served a large territory well.

Some years after joining these physicians I had occasion to speak at a medical meeting in which several adjoining county societies participated. It happened that the Secretary of the State Medical Society was there. He was impressed with my talk on collecting physicians' accounts and later published it in the state medical journal. As an indirect result of this incident I eventually joined the Medical Society of Milwaukee County.

A rather unusual situation existed in Milwaukee prior to the inauguration of their new program with a full-time secretary. Difficulties between the Health Department and the medical profession had multiplied with consequent ill feeling. Newspapers were none too friendly, and seldom favored the medical profession's view of any subject under discussion. This in itself was not unusual, but the fact that other organizations were the source of medical information and that a privately owned physicians' telephone exchange served over 200 physicians, was unusual. Officers of the Society had been disturbed by the possibilities of this telephone exchange under private management. While it was then being ethically operated, under different management it might be a source of great danger to the prestige of the medical profession of Milwaukee.

After careful deliberation, a survey of conditions existing in other cities was decided upon. The Academy of Medicine of Toledo had long sponsored a telephone exchange similar to the privately-owned one in Milwaukee, and employed a full-time secretary, and this was the first point of contact made by the officials of the Milwaukee Society. Following their survey of Toledo activities, the purchase of the privately-owned exchange, or what we call the Physicians' Service Bureau, was decided upon. The next step was to employ for the Bureau a manager who would act as secretary for the Society. This was done on October 1, 1929.

I was informed when I accepted the position with the Medical Society of Milwaukee County that all that would be expected of me the first year was to make the Bureau successful. It was soon discovered, however, that while the success of the Bureau was important, it was only a part of an ambitious program into which we just naturally expanded. Problems kept arising on all sides, which clamored for attention and the Society was pressed to act. The result has been that more committee activities were carried on by our Society during the past year than ever before in its history. There were 85 meetings of the Directors and various committees in which 47 members participated. There could have been no more enthusiastic group. This is indicated by the minutes which reveal an average attendance of 90 per cent. This fine record was undoubtedly partly due to the wise action of the President in appointing small committees. Certainly small committees can accomplish more for a county medical society than large ones, since large committees are attended by about only half of their members.

One would suppose that considerable difficulty would have been experienced in getting men to serve actively on committees, as it seems traditional that committees in many county medical organizations are purely honorary, and that no work is expected of them. In recognition of the work done by our committees it must be said that they have not followed tradition or precedent. It is, of course, true that the Executive Secretary has often had to generate enthusiasm, and help committees keep clear of difficulties. In our scheme of organization the Executive Secretary is ex-officio member of all committees and acts as secretary—recording the minutes of all meetings. Sometimes the Executive Secretary's enthusiasm wanes; he becomes a bit wearied with the conflict of personalities and opinions, and is assailed with doubts and fears, but then these low moments are compensated for by the exhilaration which follows accomplishment.

What is of most importance in organization work as in other fields, is the result. A thousand committee meetings in a year would have no significance if nothing was accomplished. We feel in Milwaukee that for a first year program the results have been more than might have been expected. I am going to tell you briefly something about them and let you judge for yourselves. We might classify our accomplishments in two groups, those which may be called service to members and those which are service to the public.

I mentioned a moment ago the purchase of the Physicians' Service Bureau. This venture represented an investment of several thousand dollars, and on its financial success depended the first-year's program of the Society. The Bureau has proved exceptionally valuable to our members. To use the service a member must subscribe to the Bureau and pay a monthly fee, for which he is rendered twenty-four hour telephone service. The Bureau acts as a connecting link between the patient and the physician. We opened on November 1, 1929, with 220 members. At present we have 270. The equipment and personnel of the Bureau has been improved from time to time until at present we believe we have a very efficient service.

The Physicians' Service Bureau acts as an information bureau for the public. Calls are constantly received on every conceivable subject. Over 52,000 incoming and outgoing calls were handled last year. A third of these were inquiries. Most of them were for specialists. The procedure followed is to refer these inquirers back to their family physician. If they have no family physician, a classified list of specialists, approved by our Educational Committee, is referred to. Three names are given from which the inquirer makes his choice. When the next call is received in the same specialty the next three names are given. In other words the list is rotated. No information in regard to treatment is ever given by an operator.

Of course our scientific programs are an important feature. Attendance has so greatly increased that our officers have been much elated. An average attendance previous to last year was 100. This was increased to an average of 188. At four out of eight of our monthly meetings the attendance ran over 250.

This increase was partly due to the fine programs, the publicity given the meetings in our monthly publication, and the last-minute notices sent members. An added attraction was the social hour which followed each scientific meeting. This hour was given over to visiting and getting better acquainted. Buffet lunch was served during the social hour and physicians, being human, enjoyed this a great deal. We feel that this feature has helped to stimulate better feeling and understanding among our members.

One of the most interesting meetings held by the Society last year was devoted to medicine in its relation to journalism. The managing editor of one of our larger dailies spoke on "A

Journalist Looks at Medicine," and an able member of our Society returned the compliment by giving the physician's view of journalism. It was an exciting and profitable evening. Both speakers expressed themselves frankly. We hope to have another meeting of this kind.

A number of unusual activities were sponsored by the Educational Committee. Among them were courses in public speaking and medical writing. The public speaking course, which was given by Professor Ewbank of the Public Speaking Department of the University of Wisconsin under the joint auspices of the University and the Medical Society, was a decided success. Over 70 members enrolled. The course in medical writing, which is still in progress under Dr. Morris Fishbein, has attracted wide and favorable comment. There are 45 members enrolled in this course which is also sponsored by the Society and the University.

A survey has been in progress during the past year under supervision of the Social Medicine and Medical Economics Committee. The first survey completed was that of charity work being done by members of the Society in Milwaukee County. The results of this survey were published in our monthly publication, and later in the Journal of the American Medical Association, where they attracted wide attention. We have received letters from all parts of the country in regard to this survey requesting more facts about our report. This report revealed that our physicians were doing charity work valued at a million and a half annually, over most of which they had no control. Our survey is continuing in all fields of medical practice, and just now we are particularly interested in our county institutions. We feel that much will be accomplished by this committee.

A collection service operated under the supervision of the Society but not by it, has been planned, and we expect that it will be opened on or about March first. Some societies have had unfortunate experiences with such a service. However, others have done well, particularly when carried on as an enterprise separate from the Society.

Among the social activities was the first summer outing which was held at one of the lake resorts near Milwaukee. Over two hundred members and their families attended this outing, which will undoubtedly become a yearly event.

Much service is rendered members by the Executive Secretary and his staff. Requests for information of all kinds are received daily. An employment service is conducted for the convenience of members. Those desiring positions with physicians are interviewed, and their applications filed. A number of secretaries have been placed in physicians' offices. The Executive Secretary of course calls on members, and on several occasions has appeared before hospital staffs to speak on Society activities.

Our monthly publication, *The Milwaukee Medical Times,* we believe has stimulated the interest of our membership. It has been developed from a four-page folder to a forty-page journal. Many favorable comments in regard to its contents and appearance have been encouraging to the editors. The *Times* has been self-sustaining.

County medical societies all over the country are taking a more active interest in public health activities. It is important that they should. In fact the leadership in this field should logically be assumed by organized medicine, otherwise changes will come to pass in the field of private practice over which the medical profession will have no control. Particularly is this true in the larger cities.

Among other activities in this field sponsored by the Milwaukee Society is the Speakers' Bureau which provides speakers for lay organizations. Since its organization a little over six months ago, increasing demands have been made upon it. Daily we receive calls for speakers. People are interested in medical and health subjects, and many favorable comments are made upon our speakers by the organizations before which they appear. Lists of subjects are sent out to clubs, parent-teacher organizations, and other groups. They select the subject about which they wish to hear, and learn the name of the physician who will speak on it afterward. This Bureau will become increasingly useful.

All press information is given out through the Executive Secretary's office. Every effort has been made to give the newspapers legitimate and reliable information, and they have responded splendidly.

One of the sore spots in our medical situation was the strained relationship between the Health Department and profession. When I first assumed my duties I had a talk with the Health Commissioner. While he was frankly skeptical as to the result, he suggested an advisory committee of five members of the Society to meet with him monthly to consider problems of his department, which affect the medical profession. Results of this closer contact have been very satisfactory to all concerned. A better understanding and closer co-operation has been brought about. At this time no action is taken by the Health Department on any matter affecting the medical profession without submitting it for the approval of the Society. If I had time I should like to tell you of some of the results of this closer coöperation.

I will take the time to tell you of one co-operative activity. A joint campaign to eradicate diphtheria was sponsored by the Department and the Society last year. This at first was not successful because the Health Department immunized without charge, and the physician could not ask his patients to come to him, when free immunization was available. Later, however, the Health Department made toxin-antitoxin available free of charge to all physicians, and much was then accomplished.

Our Health Council, composed entirely of our members, was created last year. The Council was created for the purpose of developing a public health program in which the Society would assume leadership. More recently it was enlarged to include representatives of hospitals, and nurses' organizations, who will meet with the Council quarterly to discuss mutual problems. The first session of the enlarged group was held the first week of this month.

To touch on the subject of periodic physical examinations is to consider a subject which has been discussed to death. Despite this discussion leaders in medicine have seen little evidence that the medical profession by and large have been impressed with the importance of these examinations. It is evident to those giving the subject little thought that various official and non-official health bodies are pressing forward in preventive medicine, and that the trend of the times is toward prevention of disease. Unless the profession at large accepts this point of view and actually practices disease prevention, it would seem logical that the field will be left eventually to the various organizations who are urging preventive measures.

With this in mind, the Health Council is going to put forth a systematic effort to interest the rank and file of the profession in periodic physical examinations. First of all it will attempt to determine what comprises an adequate, minimum physical examination to be given by a general practitioner without laboratory and X-ray equipment available. Such an examination should be complete enough to reveal the necessity, if any, of extensive laboratory tests.

To prepare our physicians better for this work, practical postgraduate courses in diagnosis will be given. The first, which is to be given in March, will be an intensive course on the diagnosis of the chest diseases.

A number of other activities are considered by the Health Council for the coming year, and many problems have been presented to them for solution by various organizations in the public health field.

On a number of occasions the Society has taken active interest in public enterprises. During the past few months it has given free medical service to the Goodfellow House, a home sponsored by the Milwaukee Journal for homeless and unemployed men. No member has served more than once—an hour on a certain day, and although we have operated this service several weeks, there are still members available for this work.

Naturally I have just hit the high spots in our program. While there is much tangible evidence of progress, we feel that the intangible accomplishments have been of equal if not more importance. The prestige that the Society has gained in the past year because of its improved organization has placed us in a different and superior relation to all outside groups. Daily we are impressed with the value of this increased prestige. One evidence of it is shown by the constant seeking of advice and approval of the Society by organizations and individuals who never heretofore gave the Society consideration.

While an extensive program such as ours cannot be carried on by county societies in rural communities, it is surprising what they can do. Last summer I visited my old home, the village of Frederic, Wisconsin, which, as many of you know, is located about eighty miles north of St. Paul, in the northern part of Polk County. For a number of years the medical men in the county have belonged to a five-county medical society. Last summer they were considering an independent county society in Polk County. I took occasion on my visit to urge their separate organization and in a talk given to the society pointed out what they might accomplish in the public health field and in that of social medicine and medical economics.

Since my visit Polk County has its own society, and has as its secretary a layman who is a business manager for a group of physicians at Frederic. The local paper, which I receive, indicates that they have a live society indeed. Regular monthly meetings have been excellently attended, and much interest and activity have been manifest in public health problems. Many economic problems, I observe, have been threshed out to the mutual advantage of every physician. What is most pleasant to record, there is more harmony among the medical profession than there has ever been in that part of the country. So it is apparent that whether the county society is large or small, organization can be just as effectively promoted to meet demands made upon it.

Medical men are liable to become soured on conditions which exist in the medical field today, and vent their feelings on the public. They are hardly to be blamed for remonstrating, particularly with those who know little about medicine yet contribute scathing essays on medical practice to the leading periodicals of the county. Medical men might well assume the attitude of the Confederate soldier who was trudging through the mud. Suction of the wet and sticky mud made going slow and difficult. An officer observing that the soldier was lagging rode up and bawled: "What is the matter, you? Move along." The soldier looked up in anger and despair and said: "If I ever love another country, damn me."

The bitter and antagonistic attitude of some medical men, however, does not seem justified. Problems which confront medicine may best be approached in a friendly and sympathetic attitude. Of course, this does not mean a spineless attitude.

As in all great organization activities, vision is needed in the medical field today. Better organization, a unity of purpose, and a vision which sees beyond the present and includes the possibilities of the future are essential. If the county society meets these requisites it will serve its membership and its community in full measure.

A POINT OF VIEW IN MEDICINE

E. C. Hartley, M.D.
Saint Paul

HOWEVER much the physician of today may desire to sit still, the forces directed upon him from within his profession and from outside it are too active for repose. To remain passive in the midst of this active play of opinion seems to him to press passivity to the point of stupidity. He cannot meditate on an alternative, as did Pascal and find a virtue there: "I have often said that all the troubles of man come from his not knowing how to sit still. . . . So passes the whole of life. We combat obstacles in order to get repose, and, when got, the repose is insupportable; for we think either of the troubles we have, or of those that threaten us; and even if we felt safe, on every side ennui would of its own accord spring up from the depths of the heart, where it is rooted by nature, and would fill the mind with its venom."

The physician must be a stranger to ennui even though nature had made him a native to that pleasant state. Into his profession have been thrown an innumerable series of new ideas, new things, new tendencies—a witches' cauldron boiling up unceasingly new and wider demands upon him, new responsibilities. . . . He looks on in astonishment and in fear, for he rushes to an unknown destination *under acceleration.*

He is left restless and uncertain. Yet the nature of his duties and responsibilities demands a state of mind as far removed from those qualities as is possible. He may be restless with eagerness to learn, and the uncertainty of an active curiosity may well be his, but the gratuitous unrest that goes with an ambiguous position in society is not desirable. It is a distraction. The demands which society puts upon medicine today are in direct proportion to the promises made by medicine. These promises have a proven social value so great that they must be delivered, and it is in the very process of delivering these promises that distraction has entered. That a certain dissatisfaction results is to be expected.

In this equivocal position a respect for himself, for his profession, and for the public—his patients—urges the physician to define his position, his purposes, his relations.

He may well begin by a quantitative estimation of his profession in society. The results of even a casual review will astonish him by their dimensions, and reinforce his desire for an orientation which, even though it may well fail to define accurately his position, yet may at least indicate the direction in which he is moving.

He will learn that there are approximately 1,020,000 people who are ministering in one way or another to the care of the sick and the promotion of health. Of this number more than half are hospital attendants and nurses. Physicians and surgeons number 147,000; dentists 64,500; and retail drug dealers 80,000.

At the end of 1929 there were 6,665 hospitals averaging about 150 beds each; of these hospitals, 1,795 were controlled by some governmental unit, from county to national, and 4,870 were under private agencies, chiefly church, individual, or association. The bed capacity and the average number of patients in the government hospitals are almost double those in the private hospitals. The average number of patients in hospitals in 1923 was 553,133, and in 1929 this had grown to 726,766. Of this total, 395,407 were occupying a bed because of some mental or nervous disturbance.

Computations of the cost of disease runs into vast sums—for services of hospitals, nurses, dentists, physicians, and non-medical practitioners the figure is $2,000,000,000. For medicines it is estimated that we spend $700,000,000 annually. Of this total, according to value at factory, 50.3 per cent goes for patent and proprietary medicine for sale to the general public, 28.8 per cent for tablets, pills, powders, and miscellaneous products, including medicines for self-treatment and those sold through prescription. Ethical specialties dispensed upon prescription took 15.3 per cent, while the remainder, 5.5 per cent, went for biological products. While this sum, amounting to $6.33 per capita, was being spent for drugs, only $0.59 per capita was expended for public health work through local, state, and federal agencies.

In an Indiana county, a recent survey of the medical facilities, to be later incorporated in the report of the American Medical Association's Committee on the Cost of Medical Care, shows that the per capita expenditure was $21. Of this sum less than one-third was spent for medical advice and aid, while more than one-third was spent on drugs and medicines, of which, however, only 10 per cent was dispensed by physicians. The county has 31 physicians, 5 "active" chiropractors, and 6 Christian Science practitioners. Less than half the children in the county have been vaccinated, and less than 5 per cent of the school children under 10 years of age have been immunized against diphtheria. The county spends 1.3 per cent of its income on public health, that being least of all items on its budget.

Most agencies in the field of health may be classed broadly as official and as private or non-official agencies. The official agencies may be grouped under the various administrative units in our government. In the federal government itself there are twenty to thirty agencies doing some kind of public health work. The most important of these is the U. S. Public Health Service. The work of this Service is carried on under seven divisions, each of which is quite extensive and more or less of a unit in itself. The Children's Bureau of the Department of Labor carries on investigations in infant and maternal mortality and in children's diseases. This Bureau also administered the Maternity and Infancy Act. In the Census Bureau the Division of Vital Statistics carries on a work directly related to health. In the Department of Agriculture, the Bureau of Chemistry administers the Pure Food and Drug Act. The Bureau of Entomology studies the effects of insects on the health of man. In this same Department other bureaus, such as the Bureau of Biological Surveys, carry on activities which have some relation to public health functions. It is in this Department also in which the institution of County Agents and Home Demonstration Agencies, numbering about 5,000 persons, centers. They give an appreciable amount of attention to rural health work. In the Department of the Interior the Bureau of Mines is concerned with the health and safety of miners. The Bureau of Indian Affairs maintains a corps of almost 200 physicians and 86 hospitals for the care of Indians. The Bureau of Education gives special attention to school hygiene and physical education and also cares for the health of the natives of Alaska. In the State Department, the Consular Service gives weekly reports of sanitary and health conditions of various ports and issues bills of health to vessels leaving for the United States. In the Department of Justice, the Superintendent of Prisons is charged with the care and health of the federal prisoners.

The principle of federal subsidy may be mentioned here since the subsidy granted to the states under the Maternity and Infancy Act aroused such a protest from physicians on the basis of pernicious effects of federal subsidies. It is interesting to note that for the fiscal year of 1924 approximately $145,000,000 was issued to the states as federal subsidy, and of this amount less than $1,000,000 was used for all kinds of public health work.

Under state official agencies, there are the State Departments of Health in each state, many of which maintain extensive services; for example, diagnostic laboratory services wherein millions of specimens are examined at state expense, most of these coming from physicians. In the laboratory of the New York State Department of Health there is a staff of over 200. Many states manufacture and distribute biological products such as smallpox vaccine, diphtheria antitoxin, antirabic vaccine, et cetera. They also maintain divisions for the investigation and control of preventable diseases, and for control of the sanitary aspect of water and sewerage systems and of regulating the production and distribution of milk. State Departments carry on in one form or another an educational program, chiefly by way of pamphlets issued free of charge to the people of the state. Practically all of the larger municipalities of the country maintain health departments. These frequently maintain departments for anti-tuberculosis work or venereal disease control; most of them also maintain diagnostic laboratories.

There is of late years an increasing tendency toward the establishment of county departments of health as being the logical unit for the control of contagious disease within the state. It is interesting to note that of the 3,076 counties in the United States in 1929, 1,794, or 58.3 per cent, have one or more hospitals; counties having only special Federal or State institutions are not included.

As this panorama of agencies unfolds before him, the physician constantly reminds himself that they all represent governmental efforts to bring about a universal realization of the promises of health. He reflects that in many of these efforts his services and coöperation are still earnestly solicited, while in others, such as in problems of water supply, sewage disposal, drainage, etc., the important rôle he once played remains chiefly as an historical interest—obliterated by the engineering drama now filling the stage upon which he once played his prophetic evangelical part.

Other agencies, however, are similarly engaged in this universal realization of the promises of health. These are the private or non-official agencies. They are independent. The harmony with which they play their part with the medical profession and official agencies depends upon the purpose and policy of the group, and as such is a variable. Most of them are quite specialized, as is indicated by their names. The mention of some of these groups will be sufficient indication of the quantitative part they now play in public health: The American Public Health Association, The American Red Cross, The American Association for Medical Progress, The American Child Health Association, The National Tuberculosis Association, The American Social Hygiene Association, The National Committee for Mental Hygiene, The American Society for the Control of Cancer, The American Heart Association, The National Society for the Prevention of Blindness, The National Organization for Public Health Nursing; there are the "foundations"—the Rockefeller Foundation, the Milbank Memorial Fund, the Commonwealth Fund, the Duke Endowment, the Couzens and the Rosenwald Funds. With none of these groups has organized medicine coöperated, and none has been taken over by an official agency, although some of their functions have been assumed by official groups. Dr. S. W. Welch, State Health Officer of Alabama, in 1924, said of this group: "Successful unofficial leadership, which wrests from the official agency of health duties legally conferred upon it, can prove only a menace to our Government; and this is no less true when the unofficial leadership enjoys the uttermost confidence of the people and is rich in funds accruing from the benevolence of the people. Profound altruism and devotion to the cause of public welfare on the part of misdirected leadership does not render it benign, nor does a leadership based upon sound scientific principles prove an unmixed blessing if it builds strong human bodies capable of self-control and at the same time breaks down our feeble human attempt to govern ourselves collectively."

If there is a disagreement between these two great types of agencies, the physician finds it difficult to arouse himself to any active partisanship. From them he receives pleas, orders, suggestions, and solicitations for coöperation in routine established matters, in new health projects, in new methods, in "drives," in surveys, and in educational campaigns. He is cajoled, praised, threatened, or ignored.

Irritated somewhat, and uncertain, he turns to his profession. Unquestionably it has, in a century or less, pulled itself out of a welter of ignorance and superstition of an amazing depth; it has wrenched itself loose from all associations with the past, and, on a road of its own making reached the position it now occupies. It has made its own schools and teaching methods and has devised means for their improvement and for defending their standards against those who by digressions and compromise tried to lower them.

He finds that for the United States there are 126.6 physicians for each 100,000 population. Two countries approach this number, Austria with 113.9, and Great Britain with 111.4. France has 58.9, Norway has 56.9, Belgium 53.8, Sweden 34.6; last comes Persia with 2.5.

There are in the United States 76 medical colleges, of which 20 are in three states, New York, Pennsylvania, and Illinois. These 76 colleges graduate annually 4,565, of which only 204 are women, and of which 3,211 have either an A.B. or a B.S. degree in addition to their M.D. degree. There is an annual enrollment of 21,597 students. The number of medical colleges has decreased greatly in the past twenty years. From a total of 100 in 1880, the number reached its peak of 162 in 1906. The decline was abrupt until 1915, when 96 colleges remained. The present number represents the results of a more gradual elimination, largely through the merger of two or more schools into one.

These figures are taken from the 1930 report of the Council on Medical Education and Hospitals of the American Medical Association, in whose Journal they appear. The Council was organized in 1904, and since 1905 has published its annual report in the Journal of the Association. Commenting editorially upon the work of the Council, the Journal remarks that "medical education has shown a tremendous improvement over conditions existing in 1900. . . . Early in its work the Council found that no national supervision or control had ever been placed over either general or professional education, since the constitution of the United States had left such matters to the state governments. With a few exceptions also it was found that the states had not assumed such authority, nor had any supervision or control been provided for educational institutions after they had been chartered. Consequently, the medical schools were multiplied out of all proportion to the increase in population, and by 1900 the United States had about half of the world's supply."

The physician's pride in the feat of his profession raising itself by its own boot-straps is but little diminished by the reflection that it is a constant aim of all groups and classes to do likewise. Prerequisites, ritual, technic, manner—all are in constant use to lend not only worth but exclusiveness and distinction to groups and classes. But when Mencken speaks of "the aloof, philosophical air of a dermatologist contemplating an eczema," he refers to a professional manner which has languished of late; it requires something stronger than "manner" to withstand the winds of publicity set in motion by all the agencies now so actively engaged in helping the cause of health. Increased educational standards as well as a strengthening of organization within the profession, as they become more apparent to him, may seem to the physician as twice blessed. Yet he wonders at the apathetic manner in which the public so often receives his efforts. Can it be that the higher education, as an *ipso facto* vehicle for distinction has become so common as to have lost its magic? Here, however, he is led into questions of educational values as elusive as the orientation for which his search was begun. He can only drop the question with regret.

There remains the content of modern medicine, the nature and quality of its promises. Are they absolute, relative, or only potential—realizable, perhaps, through the operation of some administrative machine of which he shall be a part? Two qualities characterize these promises at the very start, their number and their newness; it follows almost as a corollary that the promises shall be colored, in some degree, by the attributes of newness anywhere; namely, a certain diffidence and an awkwardness in delivery.

The absolute values in modern medical promises are the prevention and treatment of diphtheria, together with an accurate method of testing for individual susceptibility, a method for preventing smallpox, typhoid fever, yellow fever, hookworm, and malaria. A whole series of diseases have become relatively subject to control; this includes tuberculosis, measles, infantile paralysis, scarlet fever, diabetes, pernicious anemia, rickets, the intestinal disorders of infancy, the toxemias and infections of the puerperal state, a considerable number of primarily surgical conditions for which specific surgical procedures will bring relief, a series of endocrine disturbances for which specific glandular therapy is now available. Palliative measures of value are now at hand which even in recent years were unknown; here may be included new drugs and refinements in the manufacture of old ones—the new local anesthetics, analgesics, and sedatives, a whole new series of drugs have become available for intravenous use, thus increasing their potency in emergencies, great refinements in the treatment of fractures, of burns, of heart disease. Here, also, must be included extensive new diagnostic procedures and refinements in old methods; the X-ray, the electrocardiograph, methods for determining the metabolic rate, the significance of changes in the blood cells, a practically new science of blood chemistry. There is a tendency away from surgery as a field in itself towards renewed interest in medical treatment, toward functional study, toward relationships between organs, and of organs to constitution. There has been a tremendous expansion of content and promise in the field of mental diseases and the neuroses, with mental hygiene as an attendant development.

The medical literature already written concerning these subjects is extensive. The newcomer, the occasional wanderer therein quickly loses himself. Yet the physician knows he must either become familiar with its maze, or rationalize himself into contentment outside. Possibly, he feels, it is this tremendous scope and newness of medicine which has contributed as much as has a lack of organization to a certain slowness in bringing the promises to realization on a universal scale. Indeed, this point often enters into discussions of modern medicine. Dewey says: "Ideas formed in the days when it was reasonably possible for a man who had been studiously through the schools to master the sum total of learning too largely control the schools of today."

An idea, expressed by H. H. Moore in his book, "American Medicine and the People's Health," recurs again and again: "The spectacle of human beings enduring suffering and death from diseases which may readily be prevented will appear rather annoying to a citizen of the twenty-fifth century reading for the first time the history of the present age." This, he believes, is due to a lack of adjustment somewhere in the recent evolution of medicine and he considers it as "an example, perhaps, of a social phenomenon, which William F. Ogburn has called 'cultural lag.'" This lag, he believes, expresses itself in the comparatively unorganized condition of the majority of physicians. There is a lag in the development of machinery for the utilization of the promises of medicine. This lack of coordination, however, the physician knows is felt. President Hoover's White House Conference on Child Health is distinctly an effort at coordination.

Numerous specific examples of a slowness in bringing health promises to general use occur to the physician and may be called expressions of "cultural lag" with as much accuracy as they might be termed neglect. Thus, vaccination against smallpox was known even before the time of Jenner (1798), but it is far from being universally practiced today. It was ten years after Behring's discovery of diphtheria antitoxin before our physicians generally made use of it, and even today, with a means for preventing diphtheria at hand, the disease still kills hundreds of children yearly. There was a similar slowness in adopting Pasteur's inoculations against rabies. Sir Humphry Rolleston observes that "unfortunately the art of healing may lag long behind the scientific milestones." He cites the inertia following Harvey's discovery of the circulation of the blood; blood transfusion, though done in the seventeenth century, did not become routine until the Great War; Christopher Wren originated the intravenous injection of drugs, but the general use of this method did not come until 1910, with Ehrlich's arsphenamine discovery; Davy discovered nitrous oxide gas in 1799 and its use as an anesthetic was demonstrated the following year at Guy's Hospital; but the American Lang (1842), Wells (1845), and Morton (1946), with their use of ether, first brought anesthesia into general use. It was forty years after James Lind showed how scurvy could be prevented that the British Navy put his simple remedy into use and banished this ancient scourge. The same lag was apparent after Lister first demonstrated his antiseptic method in surgery. The lag in the fight against puerperal (childbed) fever is a classic example of the medical prophet without honor—even in his own country. The physician's regret at this failing in his profession is not relieved by a similar, and perhaps equally grievous, lag in law, in politics, or in education.

Here again, as at other points in his speculations, the physician must consider the effect of mass. Before he can practice his art, he must somehow give movement to his knowledge, and the difficulty of this effort is in proportion to the mass of knowledge he has accumulated. This explains, in part, the facility with which physicians of even twenty-five years ago practiced their art, the time they had to impress themselves upon a world ready and susceptible to the sympathy and good cheer which sprang, perforce, from minds whose relative dearth of scientific content led them to embrace a priestly instrument as preferable to that of the charlatans'. The physician by no means intends to deride the part of sympathy in the presence of suffering; its rôle, however, while still important, must be filled by a lesser portion of the physician's mind now taken up more and more with critical selection from the range of diagnostic and treatment possibilities before him. Yet much of the criticism directed against him today is less concerned with his mastery of the present content of medicine than it is with his departure from the pleasant, simple ways of the past.

The scope and complexity of medicine have produced another result for which the profession is criticized, no doubt justly. Doctors are said to protect one another, that this mutual *laissez faire* attitude in the presence of mistakes on the part of their colleagues is an anti-social act. The validity of this criticism becomes less certain when this fact of the mass of medical knowledge is realized. To condemn a doctor for slowness in absorbing it, for slowness in giving it movement, for inaccuracy in interpretation, is a difficult thing to do without qualifications; even to detect dishonesty in its use or wilful neglect in its execution is by no means as simple as it may seem. Indeed, the public, in their enthusiastic support of follies in the field of health are guilty of a worse error, since their action reverts to the use of magic and superstition and a discarding of method in the choice of means.

The physician must revert again to education in spite of his ignorance, since the term has appropriated every aspect of intellectual method.

Dewey speaks of the confusion and distraction of modern education in which almost everything "finds its way into 'courses' and textbooks." The task, he says, is to reduce and simplify the course of study. He would cease inculcating information in quantity and offer instead a development of an "independent method of thought and inquiry" by a full treatment of a limited number of typical groups of material. Of education in science he says: "The essentials of scientific method, of a certain way of looking at things and seeking and weighing evidence, in short the development of judgment, are swamped in the acquisition of information, all the items of which stand on the same level and are equally subject to belief or unbelief. The mind is left more ready to seek for signs and wonders, and more ready to grasp at and swallow whatever is presented in print. The mere mass of what is offered daily, monthly, and yearly, overpowers independent judgment and creates a state of intellectual impotence; the mind is oppressed rather than enlightened." Here, he says, signs of improvement may now be found in professional education which "simplify not by arbitrary limitation to traditional portions of the field, but by emphasis upon subject matter that is strategic in developing command of method." He finds failure in "fundamental intellectual achievement" due chiefly to two traits: "undue deference to anyone who obtains popular prestige as an 'authority' in any field, and an accompanying credulity of mind that undiscriminatingly accepts for a time anything offered, only to turn soon to some newer topic." The physician readily discovers these traits not only in himself and in his profession, but with especial clearness in the recent efforts of organized medicine to educate the public in matters of health. To a large extent, many offsprings of this effort as reflected in individual and social response, often made with a certain aplomb as having a sound "scientific" basis, are the opposite of scientific. In his Grammar of Science, Karl Pearson says, "The classification of facts and the formation of absolute judgment upon the basis of this classification—judgments independent of the idiosyncrasies of the individual mind—essentially sum up the *aim and method of modern science.*" He describes the function of science as "the classification of facts, the recognition of their sequence and relative significance."

At times, when the physician sees to what an extent special moral and commercial connotations are mixed with the promises of health he wonders how the contamination is achieved with so little comment. His reaction to a recent article in Harper's on the superstitions of southern negroes in obstetrical matters was to reflect how largely a similar folly possesses and guides many college graduates in northern white people. He turns now to another statement of Pearson's, "Modern science, as training the mind to an exact and impartial analysis of facts, is an education specially fitted to promote sound citizenship."

At once, it seems, the whole question becomes simpler—not of solution, perhaps, but of description. It is no longer a vague, restless disturbance, but a definite condition having definite causes and immediate results quite reasonable in the sequence as it has so far revealed itself.

The physician feels that his desire for orientation is shared by educators, statesmen, sociologists, and economists—by everyone, indeed, who is trying to understand those swirls and eddies which are caused by the sudden influx of new ideas and new forces into the quiet pool of society: not the least of the forces involved being the inertia of society itself, now grown to vast proportions through mere quantitative increase in bulk. He recalls Osler's statement that the introduction of quinine was one of the most powerful forces in our present civilization.

With all the others, then, the physician feels that he must turn to the task of arranging his material, of developing skill in the use of the scientific method, of clarifying and simplifying the promises of health. If he finds that others are using the same tools in the solution of their difficulties he feels that there will be less and less need for the growth or even existence of many of those large intermediary groups whose interpretive and administrative functions now seem so necessary. Patience, if not evoked, is imposed by circumstances, and as such becomes a burden and a punishment rather than an aid.

Here, then, is a field in which his utmost industry may be employed. If society will understand his task they will make it easier by not requiring him to defend it from the intrusion of methods which, as they now command no respect from his own profession, will then inspire none from society upon whose ignorance they now maintain their saprophytic life.

Havelock Ellis, in discussing some observations of Jules de Gaultier on the artist, said: "If he seeks to mix himself up with the passions of the crowd, if his work shows the desire to prove anything, he thereby neglects the creation of beauty. Necessarily so, for he excites a state of combativity, he sets up moral, political, and social values, all having relation to biological needs and the possessive instinct, the most violent of ferments." The physician feels himself respond to this view. Like the artist, he hopes that "by revealing the spectacular character of reality he restores the serenity of its innocence."

625 Lowry Medical Arts Bldg.

BISMUTH IN THE TREATMENT OF SYPHILIS

In the selection of a bismuth preparation the different factors come up as to whether one wants a soluble or an insoluble preparation, how often the dosage is going to be given, and how rapidly it is desired to have the preparation absorbed. The average effective bismuth preparation should contain from 0.03 to 0.2 Gm. of metallic bismuth in a dose and a course of therapy lasting eight to ten weeks should probably amount to from 0.6 to 2 Gm. of metallic bismuth. The Council on Pharmacy and Chemistry has gone on record as opposed to intravenous bismuth therapy. The therapeutic dose is too close to the toxic dose; therefore one is limited to intramuscular injections. If one is desirous of a preparation with comparatively rapid absorption and one that probably should be given twice a week, one might employ the thio-bismol in a dose of 0.2 Gm. (metallic bismuth, 0.075 Gm. per dose); or the potassium sodium bismuth tartrate, aqueous solution, usually with a dose of 0.1 Gm. (metallic bismuth, 0.04 Gm. per dose). These soluble preparations should be given twice a week and are hardly suitable for general office practice. When one administration per week is feasible only, one is forced back on the use of a soluble preparation suspended in oil, or an insoluble salt suspended in oil. Recently, there has been a turn to the use of liposoluble bismuth preparations; there is a claim that these combine the good points of both the soluble and the insoluble salt, but it is too early to answer this question definitely. (Jour. A. M. A., May 16, 1931, p. 1721.)

THE INSTITUTIONAL CARE OF TUBERCULOSIS*

H. A. Burns, M.D.
Superintendent Minnesota State Sanatorium
Walker, Minnesota

THE approach to a consideration of the function of the modern sanatorium in the tuberculosis program must recognize first the background, historical and social, out of which the institution has evolved. Secondly, we must evaluate the sanatorium's success in adjusting itself to new conditions as experience and research guides us ever closer to the ultimate control of tuberculosis.

While the hospital is a human institution as old as recorded history, in its modern setting it is one of the later developments following the intellectual revival in Europe. During the eighteenth century, the hospital became of recognized importance in the larger cities. During the middle of the last century, the first special hospital for the cure of tuberculosis was put into operation. At a time when tuberculosis caused one-seventh of all the deaths in Germany, Herman Brehmer in his doctorate thesis of 1853 maintained that tuberculosis was a curable disease, basing his conclusions upon the frequent observation of healed lesions at autopsy. Brehmer established the first successful sanatorium in the world in 1859.

Because of the many and confusing symptoms of pulmonary tuberculosis as shown by percussion, auscultation, palpation, and by the surgical forms of the infection, this disease early stimulated the greatest clinicians in the profession to its study. The special hospitals for the tuberculous gave the followers of Bayle, Laennec, Villemin, and Auenbrugger an opportunity to apply their teachings relative to diagnosis and physical findings. Treatment was given more prominence in the physician's attitude to the patient following the advent of the special hospital and still more as a result of the discovery of the tubercle bacillus by Koch in 1882.

There are few, if any diseases, that have caused nearly the number of tragedies in family life as tuberculosis. For many centuries and in all nations this wasting disease has been rather definitely identified and feared. There is every reason then that as soon as men suspected it possible to discover the nature of tuberculosis many workers would become interested in the search for more knowledge concerning this devastating disease about which a vast field of information suddenly became available for the physician's use. Because of the marked nutritional disturbances and its chronicity, the clinical symptoms were given much attention, while other phases of the problem were allowed to remain unnoticed.

One of the early misfortunes in the institutional care of tuberculosis was the change of the tuberculosis hospital into a sanatorium. After some twenty years, we are now trying to salvage as much as possible of the sanatoria that tuberculosis hospitals may survive. There is a drift even now towards the inclusion of the tuberculosis patient in the general hospital, and it is conceded that with the establishment of a proper technic there could be no public health opposition.

The institutionalization of wards of the State while of ancient origin became prevalent during the early part of the last century and grew rapidly until the period following the World War. The State has attempted in the past to institutionalize its penal, domiciliary and therapeutic dependents. Because of the economic burden imposed upon the taxpayers by this increased load, the necessity of limiting the multiplication of institutions has become apparent.

The preventorium as an adjunct to the sanatorium in the care of the tuberculous can be largely, if not totally, eliminated by adequate supervision by the public health nurse of the child in the home. Many of the cases of adult tuberculosis where the individual is mentally, economically, and emotionally equipped to coöperate with the family physician and the field agencies can be given at least as effective care outside the sanatorium as can be given inside. Before these changes can be adequately established, the field service must collaborate with the sanatorium physicians in turning over under their supervision the therapy of selected cases among the tuberculous to the family physician.

---

*Presented before the Lymanhurst Medical Staff on December 11, 1930.

There are three individuals who should be concerned in the care of the tuberculous: the family physician, the epidemiologist, and the sanatorium physician. The maximum social results in terms of prevention and cure will not be accomplished until these three are brought together with a sustained medical interest and responsibility throughout the period of their medical supervision.

Early in sanatorium work in this country, there was a very definite and a very unfortunate separation of the two fundamental elements which together should compose the tuberculosis hospital.

One school espoused the clinical importance of the sanatorium and insisted that the institution served no other purpose than the treatment of the individual case. This school was unconsciously attempting to induce the governmental unit creating and supporting the institution to foster "State Medicine."

Considerable evidence in support of this statement has developed from time to time in many sanatoria. However, the return of the sanatoria to a hospital status has made it possible for the physician in tuberculosis work to coöperate with the general practitioners and the specialists. He now becomes one of a partnership whose business it is to care for the sick.

The second group considered that the institution should be primarily for the removal of the infected and infecting individual from the home, and that the institution was created primarily to serve a purpose in preventive medicine.

The clinical point of view won out, and for twenty years preventive medicine has been pleading, usually to locked doors and deaf ears, to apply the same epidemiological methods to tuberculosis that have proven so effective in the control of most of our infectious diseases.

One of the most hopeful tendencies at this time is that during the past few years there has been demonstrated in many quarters an expression of friendliness between these two opposing groups, an apparent desire to get together in the proper management of this problem of tuberculosis control. We now concede that from a public health point of view the sanatorium is an adjunct to the epidemiologist primarily, and to the clinician secondarily. The modern institution for this reason cannot operate successfully and effectively without coördinating its clinical work with its field service. A well-balanced sanatorium must function in the field as effectively as it does at the bedside in the institution. The final coordination of these two activities will accomplish what either alone can never do.

The sanatorium, as its name implies, has unfortunately divorced itself from the hospital, and now for various reasons it requires a hospital status to bring to its tuberculous patients the advantages of modern medicine. Where isolation was once a requirement, consultants in many specialties are now sought. Where one doctor was required to serve as a care taker, now a corps of well trained physicians are essential. Where fresh air was given afar off to insure purity, purified and conditioned air can be obtained at any place desired. Sunshine can be given twenty-four hours daily. Altitude and season are of little importance so long as you have a lamp and a wall plug.

It was but a short time ago, and some of the textbooks still inform us that in the selection of a sanatorium site one must choose protection from the prevailing winds, and it must be located on sandy well drained soil removed from congested districts where the atmosphere might be charged with dust. These elements considered of most importance but fifteen years ago are very distinctly of secondary importance today.

Our sick tuberculous patients are not in search of seclusion or a home. They want treatment and maximum recovery in the shortest possible time. To render the patient the service required, we must vacate the sanatorium and enter the tuberculosis hospital.

The evolution of the hospital since the days when the sick were laid in the precincts of the temples of Greece and Egypt had not changed greatly prior to the middle of the nineteenth century, when the etiology of disease was attracting the attention of the medical profession, and the special hospital was emerging from the old general hospital. The modern hospital, while elegant in exterior, furnishings, and equipment, has not in some instances changed greatly from the general hospital of a century ago.

The most outstanding similarity is perhaps the lack of a contagious technic. With the development of the special services in the modern hospital, we have an aseptic technic in the operating and delivery rooms and a special technic for the contagious ward. We have no protective routine for the new or unknown case that is as dangerous and possibly more so than the one diagnosed and under treatment.

The tuberculosis sanatorium is a development of the specialization in hospital care of the sick. There has been much added to the original sanatorium, but like the modern hospital it has also failed to establish a protecting technic. A nurse trained in contagious technic would be unable to work in the present day sanatorium because the contagiousness of tuberculosis is not recognized in the set-up of the institution.

The educational and training facilities in the sanatorium have been neglected. Only recently have some of the sanatoria located near medical centers developed in a moderate way the training possibilities within their possession. The sanatorium too often has considered itself a closed staff and its nursing service of secondary importance. Every sanatorium should offer training to pupil nurses in both bedside care and field nursing. In a general way the ex-patient, physician or nurse should not be employed in sanatorium work, since they have made an adjustment to the type of institutional work which will make the fewest demands upon their time and energy. Efficient medical and nursing care calls for energetic and physically strong workers, who are interested in developing and maintaining an association among patients and employees that will in no way endanger either.

The staff of the sanatorium too often isolate themselves from the profession and complain about the lack of the coöperation they receive. The tuberculosis hospital should encourage clerkships and junior staff members whose residence is a part of their preparation for practice. This contact with the profession will benefit the sanatorium, the profession, and most of all the medical staff of the sanatorium.

A fundamental change in sanatorium administration involves the extension of a contagious technic throughout the institution. The tuberculosis sanatorium should be remodeled. It must treat rather than tolerate sick people. It must train many of them to live as "carrier cases" in their communities and homes and to live so as not to endanger others. The tuberculosis hospital must be staffed by highly trained physicians and nurses trained both in treatment and preventive medicine. The field work must be recognized of as much importance as the hospital. There can be no rest hours, and there can be no pension positions for part-time employment in these services.

The educational facilities offered patients in the sanatorium of the past have been altogether inadequate from an epidemiological point of view. The occasional talk by the physician and the cursory reading of health books and journals by the patients does not often aid in the development of new health habits, unless they can be repeated and rehearsed in the institution and continued under nursing supervision after discharge.

We acknowledge the fact that there is a considerable variation in the virulence of tubercle bacilli, yet our attempt to educate the patient to the danger of reinfecting himself with a more virulent strain of the organism is never considered. The sanatorium frequently employs the positive-sputum patient, sometimes even as a food handler. The danger of reinfecting a group of patients is more serious possibly than giving the initial infection to a group of well people.

We do not know just what the danger may be as a result of this type of contact, but we know that it has possibilities that should not be ignored. All dishes should be sterilized and each patient should be taught to carry out as far as possible a contagious technic in his contact with fellow patients. The criticism at once arises that we would make neurasthenics out of our patients. Possibly, but more certainly we shall make them safe, and we shall increase their chances for recovery.

Most patients have a determination to recover which too often is interpreted as being the optimism of the tuberculous. This "will to recover" is a power in the hands of the physician. Education and information in a very great measure replaces discipline. The "will to recover" is seldom emphasized, yet it, rather than contentment, is and must remain the greatest single aid to every hospitalized man or woman who is ill with pulmonary tuberculosis. The sanatorium was created to provide for the patient an environment in which contentment was a dominant factor. The tuberculosis hospital's interest in the patient's attitude centers upon his "will to recover."

CONCLUSIONS

The tuberculosis hospital is a teaching, a therapeutic, and a prophylactic institution, while the sanatorium has been and still remains largely a domiciliary and a therapeutic institution.

The training of patients to live outside of the institution without endangering others is a public health necessity which if carefully developed would result in the discharge of many cases now occupying hospital beds while receiving domiciliary care.

The family physician, the institutional physician, and the epidemiologist working together will bring as good treatment to the tuberculous as they have received in the past from the institutional physician alone. Through this coördinated medical effort material progress will be made to reduce in number our cases approaching an eventual breakdown. This association will make possible the care of many patients at home or in local general hospitals who now remain neglected. We will bring the tuberculosis problem under general medical supervision and control, a condition which can never be realized if the disease continues to be considered an institutional problem alone.

Our great task today is to save the tuberculosis sanatoria from themselves. Hope in the future lies in a group association including the family physician, the epidemiologist, the clinician, and the nurse both in the institution and in the home. It must be through these new alignments in our measures of treatment and control that will give us a chance to salvage all that is good of the present day sanatoria and from it produce the tuberculosis hospital. It is our opportunity now to make a contribution to preventive medicine that will mark the genesis of a new day in tuberculosis control.

MAGNETIC BELTS

The Council on Physical Therapy reports on the "Vitrona" and "Theronoid," stating that during the past four or five years there have been exploited to the public under various names solenoids for use in connection with the house electric light circuit, for the alleged purpose of curing or alleviating human ailments by means of magnetism. The Council points out that the original device of this kind was the "I-on-a-co" and that two of the most widely advertised and extensively pushed imitations of the I-on-a-co are, respectively, the "Vitrona" of the Rodney Madison Laboratories, Inc., and the "Theronoid" of the Theronoid Corporation. The Council describes the construction of these outfits and discusses the claim that the apparatus will magnetize the iron in the blood and that such magnetization will bring about the cure of many diseases and conditions. The Council states that it has been known for a half-century or more that magnetism has no demonstrable effect on the human body and its processes. Because of many inquiries received, the Council carried out experiments with the Theronoid and Vitrona. Independently, A. J. Carlson carried out experiments and found that the Vitrona produced no effect of energy metabolism. Other experiments were carried out all of which demonstrated that the Vitrona produced no effect on the human organism within the influence of the coil. Similar experiments with the "Theronoid" showed that absolutely no absorption of power by a human subject surrounded by the Theronoid could be detected. (Jour. A. M. A., May 16, 1931, p. 1693.)

TUBERCULOSIS OF THE ANUS AND RECTUM*

Charles K. Petter, M.D.
Senior Resident Physician, Glen Lake Sanatorium
Oak Terrace, Minnesota
Walter A. Fansler, M.D., F.A.C.S.
Consulting Proctologist, Glen Lake Sanatorium
Minneapolis

TUBERCULOUS lesions in and about the anus and rectum, though constituting a comparatively small part in the vast field of tuberculosis, are of sufficient importance to warrant special consideration. While tuberculosis, as a disease, manifests itself usually as a pulmonary lesion, the possibility of its affecting any organ or tissue must not be overlooked. Therefore in every case of phthisis one should take a history specifically covering symptoms referable to the anus and rectum (pain, swelling, bleeding, discharge); likewise the physical examination should not be limited to the part manifestly affected, but should be general, including proctoscopic.

The tuberculous lesions which one finds in the anus and rectum are not numerous, and, with exceptions which will be mentioned, are just as amenable to treatment as lesions elsewhere in the body. They can be divided, roughly, into two groups, as follows:

1. Perianal cutaneous tuberculosis.
    a. Miliary tuberculosis of anal skin.
    b. Tuberculosis cutis orificialis.
    c. Lupoid cutaneous tuberculosis.
    d. Tuberculous anal ulcer.
2. Perirectal abscess and fistula in ano.

Tuberculous ulceration in the rectum itself is not included in the present discussion because it always occurs as part of a more general intestinal tuberculosis, and therefore does not present a true proctologic problem, but one for the gastroenterologist.

Miliary tuberculosis of the anal skin occurs in conjunction with acute general miliary tuberculosis, which is highly virulent and rapidly fatal.

Tuberculosis cutis orificialis occurs in the mucous membrane and adjacent skin of patients who have no resistance to tuberculosis, and has been encountered by us in adults who are in extremis.

The lupoid forms occurs as a subcutaneous nodule covered by healthy but slightly bluish skin, and is seen in patients who have a manifest resistance to tuberculous infection. This lesion is diagnosed on biopsy. In some cases it may go on to central necrosis with resulting ulcer formation. Surgical removal or destruction with actual cautery, followed by ultra-violet radiation, gives very satisfactory results.

Table I

PROCTOLOGIC FINDINGS IN A GROUP OF 190 MALE PATIENTS ON ADMISSION TO THE SANATORIUM

NORMAL	52	27%
PATHOLOGIC CONDITIONS	138	73%
Int. Hemorrhoids	94	
Cutaneous Hemorrhoids	34	
Hyp. and Inflamed Anal Papillæ	21	
Anal Fissure and Ulcers	13	
Fistula in Ano	13	
Scars of Operation (abscess, fistula)	4	
Thrombi Ext. Hemorrhoids	8	
Peri-rectal Abscess	1	
Stricture of Rectum (Injury)	1	

Total of 189 Lesions in 138 Patients

The so-called anal ulcer, we feel, is a definite clinical entity and its evolution can in most cases be easily followed. For example, a patient may complain of definite pain and possibly some bleeding at the time of defecation. This leads us to suspect a simple anal fissure, and examination reveals the presence of such a lesion. Then, after a week or so if the fissure is not treated, the patient continues to complain and examination then shows a ragged, indurated, fiery red ulcer at the site of the previous simple fissure. Records of the case reveal that this patient has a decided positive sputum or active intestinal lesion, which has been the source of infection of the fissure.

We have found the best treatment for these lesions to be section of the external sphincter, followed by destruction of the diseased tissue with the cautery. Daily applications of heat and ultra-violet irradiation, hasten healing of the operative wound.

---

*Read before the Clinical Section, National Tuberculosis Association, at its annual meeting, Memphis, Tenn., May 10, 1930.

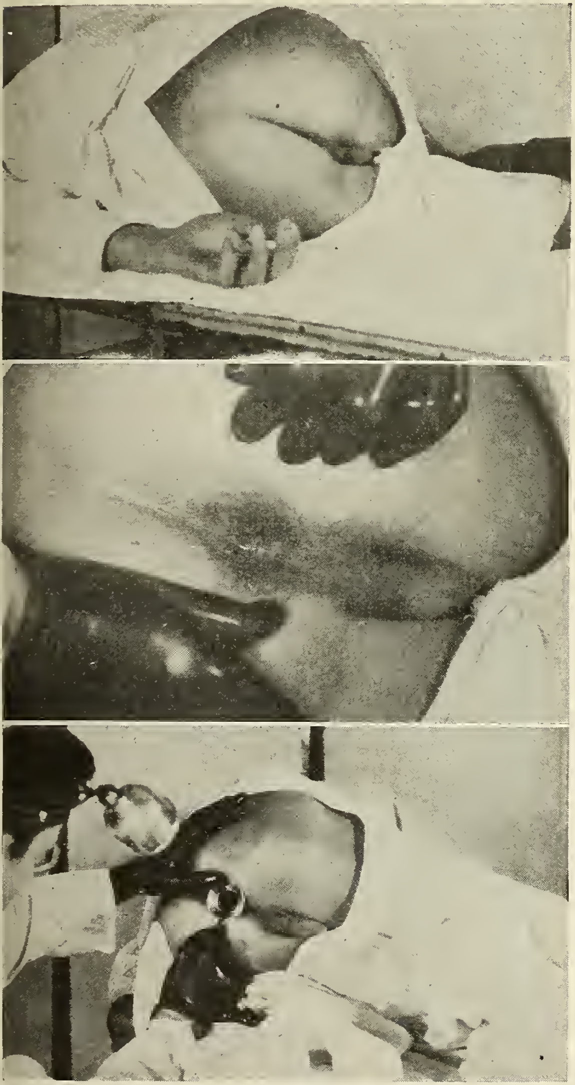
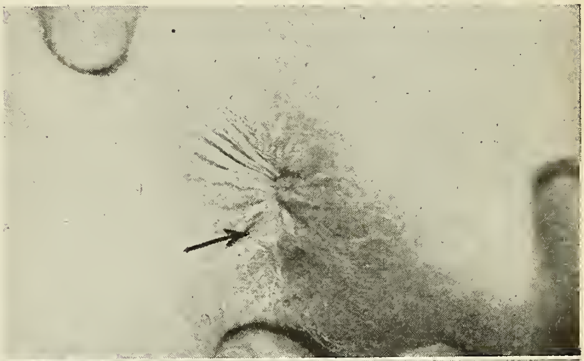
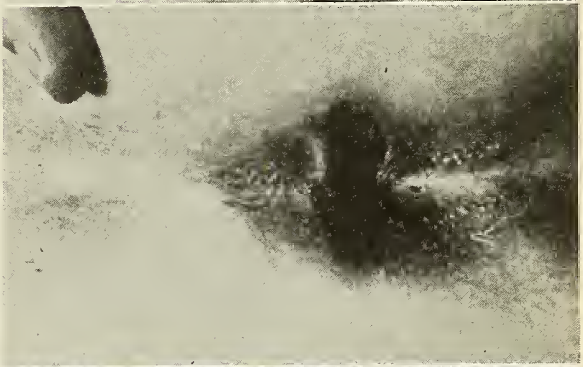


Fig. 1. Patient in Sims position renders adequate external and proctoscopic examination easy.

In the examination of 551 patients we have encountered twelve cases of tuberculous anal ulcer, two cases of tuberculosis cutis orificialis and one case of the lupoid form.





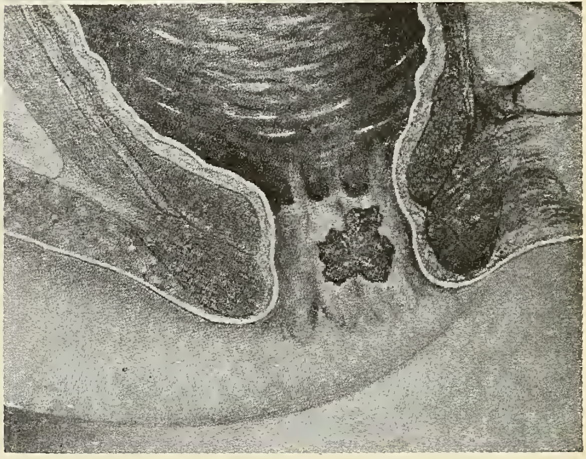


Fig. 2 *(Top)*. Lupoid tuberculosis of peri-anal skin.
Fig. 3 *(Center)*. Tuberculosis cutis ani.
Fig. 4 *(Bottom)*. Tuberculous anal ulcer.

Perirectal abscess and fistula in ano really constitute a single topic, for fistula is the result of an untreated or improperly treated abscess. Perirectal abscesses develop from infection in an anal crypt. The crypt becomes inflamed, sealed over and the infection burrows into perirectal tissues and eventually ruptures through the skin or less frequently back into the bowel. The usual history in a case of this type is about as follows: the patient notices some soreness about the anus, then after a few hours a painless swelling adjacent to the anus. As time goes on this mass enlarges and frequently becomes very painful be-

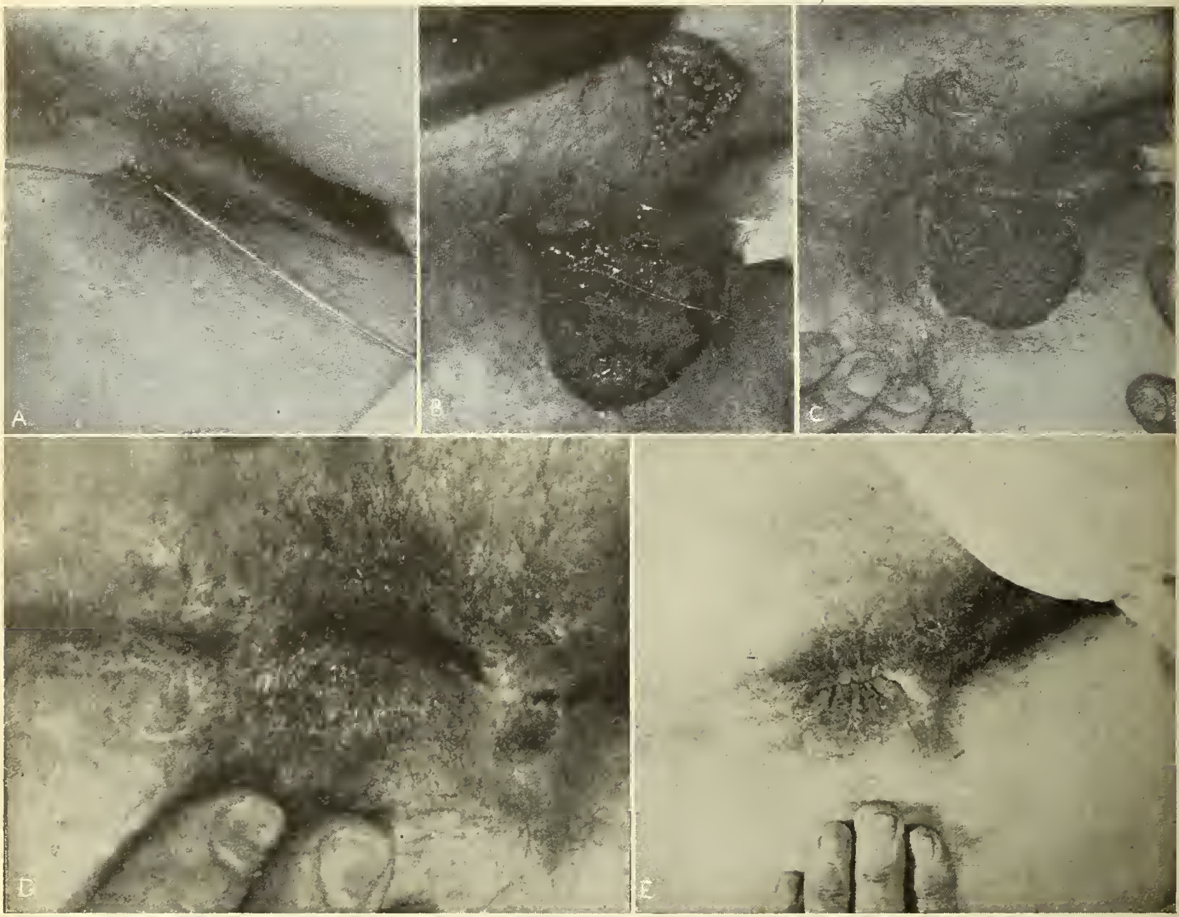


Fig. 5. A typical abscess and its treatment. (a) Marginal abscess. (b) Overlying skin removed. (c) After curettage and cautery. (d) Three weeks postoperative. (e) Healed, six weeks postoperative.

fore it ruptures or is lanced. The resulting fistula then follows one of two courses, until operated, namely, it continues to increase in size, with increasing numbers of sinus tracts, or it may go through alternating periods of closing over and breaking down.

Whether it be an abscess or the resulting fistula which one is called upon to treat, the procedure is essentially the same, that is, to dissect out all abscess cavities or fistulous tracts, to demonstrate if possible the opening into the bowel, and to dissect it out as well. We have obtained good results in our series by cauterizing the abscess cavities and fistulous tracts thoroughly with the actual cautery. This applies as well to the opening into the bowel. Remember, the internal opening into the bowel must have been present in order that the abscess could form, but it may be closed at the time of examination. Also remember that the internal opening always occurs in an anal crypt.

Very frequently one is compelled to perform two or more operations before an extensive abscess or fistula can be properly remedied, and this is one reason why surgeons frequently frown on a case of fistula in ano.

Table II

ANO-RECTAL TUBERCULOSIS LESIONS FOUND IN A GROUP OF 320 RESIDENT PATIENTS REFERRED BECAUSE OF ANO-RECTAL SYMPTOMS

	Male	Female	Total
Peri-Rectal Abscess	11	10	21
Fistula in Ano	10	2	12
TBC. Anal Ulcer	1	0	1
TBC. Cutis Ani	1	0	1
TBC. Proctitis	0	1	1
Total	36 or 10%		

From previous work we have found peri-rectal abscess and fistula in ano in 6% of 1,500 tuberculous patients whose records were examined.

The post-operative care of these lesions demands much of the patience and time of the physician. It is essential that the wounds be kept wide open and compelled to heal by granulation for if the edges come together, further fistulous and sinus tracts are prone to develop. We have found the hot sitz bath or infra-red lamp of definite value in hastening the process of repair. Ultra-violet irradiation is a valuable adjunct because of its stimulating action on healthy tissue and its probable specific action on tuberculous disease.

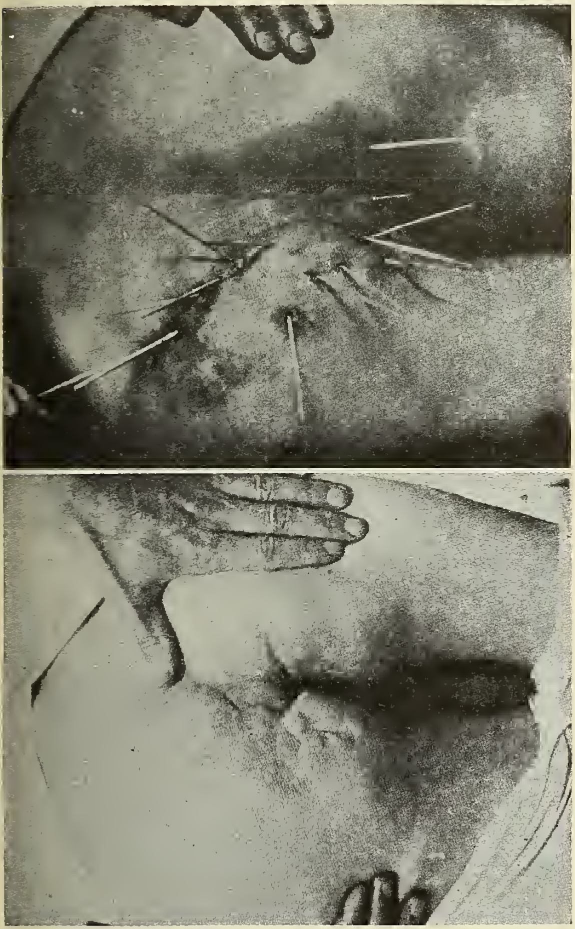


Fig. 6. *(Above)* An extensive fistula. *(Below)* After surgical treatment as outlined in text.

It has been our privilege to study 101 cases of abscess and fistula. From this study several important facts have been learned.

The "proof of tuberculosis" is often quite a task. Smears of exudate are not reliable nor are guinea pigs inoculated with the exudate wholly dependable. We have found that a combination of three laboratory procedures gives us a reliable "proof of tuberculosis." These are: (1) exudate in guinea pig; (2) macerated tissue in guinea pig; and (3) tissue section. Frequently tissue section will show a histologic picture of chronic inflammation, but no tubercle formation, and a piece of the same tissue macerated or suspended in formal saline and injected into a guinea pig will show definite evidence of tuberculosis.

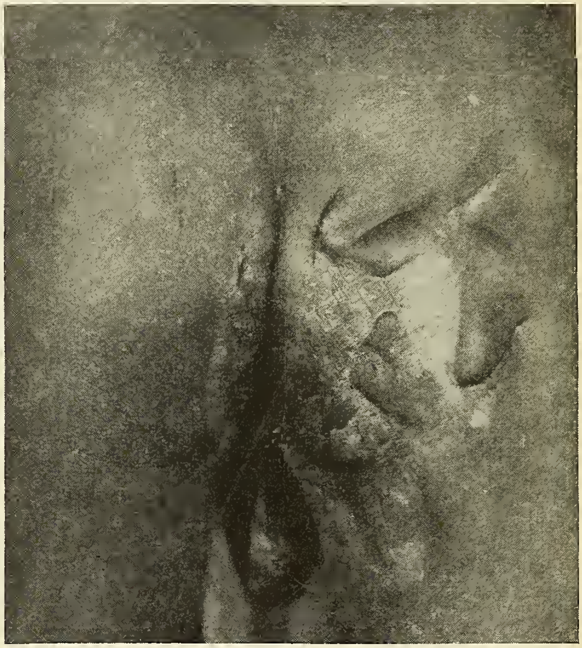


Fig. 7. The result of proper surgical treatment of an extensive fistula.

Table III

CLASSIFICATION OF ANO-RECTAL TUBERCULOSIS LESIONS

1. Tuberculosis of Perianal Skin:—
    A. Miliary Cutaneous Tuberculosis.
    B. Tuberculosis Cutis Ani.
    C. Lupoid Tuberculosis.
2. Tuberculous Anal Ulcer.
3. Tuberculous Proctitis.
4. Tuberculous Peri-rectal Abscess and Ano-rectal Fistula.

When should one treat a fistula or abscess surgically, in the tuberculous patient? Certainly one would not attempt a surgical procedure unnecessarily when a patient is acutely ill. We have found the best policy to be as follows: (1) drain abscesses as soon as they point; (2) keep fistulæ open to prevent burrowing, and then (3) perform radical operation when the patient's general condition warrants it. We do not feel that anything is to be gained by undue delay in operation.

By cleaning up a lesion surgically it is our opinion that the body is relieved of one extra focus of disease, and we have noticed general improvement in the majority of our patients so treated.

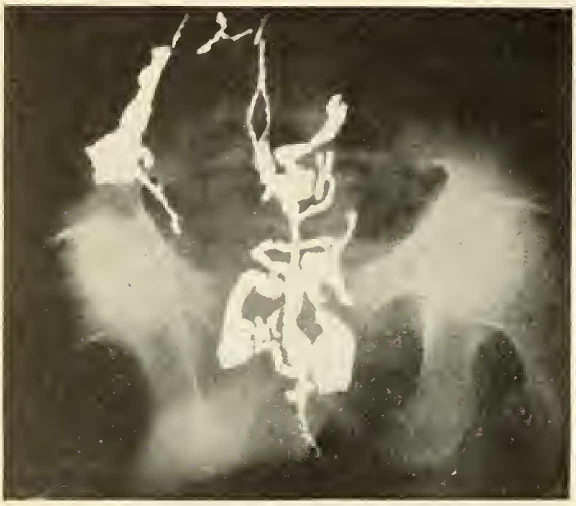


Fig. 8. The end-result of a recurrent peri-rectal abscess which was lanced every two or three years over a long period of time; ramifying sinus tracts all through pelvic fascia.

Positive sputum was present in all but five of our series, and an active enteritis existed in ten.

Table IV

THE SUMMARY OF OUR RESULTS WITH PERI-RECTAL ABSCESS AND FISTULA IN ANO IN 101 CASES

Cases Observed—101
Cases Proven Tuberculous—80—80%
Cases Inadequate or no Laboratory Work—21—20%
Cases Operated—78
    Proven Tbc—70—90%
    Inadequate Laboratory Work—8—10%
    Healed—65
    Healing (Recent Operation)—5 } 90%
    Dead—8—10%
Cases Not Operated—23
    Proven Tbc.—10—43%
    Inadequate or No Laboratory Work—13—57%
    Healed—8—35%
    Dead—15—65%

In tuberculous individuals we have observed perirectal abscess and fistula in ano in 5.8 per cent.

Of the seventy-eight cases undergoing operation, far advanced pulmonary lesions existed in fifty-seven; moderately advanced lesions in eleven; incipient lesions in five; bone lesions in two; and in three we were unable to demonstrate any evidence of a tuberculous lesion elsewhere in the body. The results in the seventy-eight cases treated surgically show 90 per cent healed and 10 per cent unimproved or dead; while those cases which for various reasons were not subjected to operation showed 35 per cent improved or healed, and 65 per cent unimproved or dead.

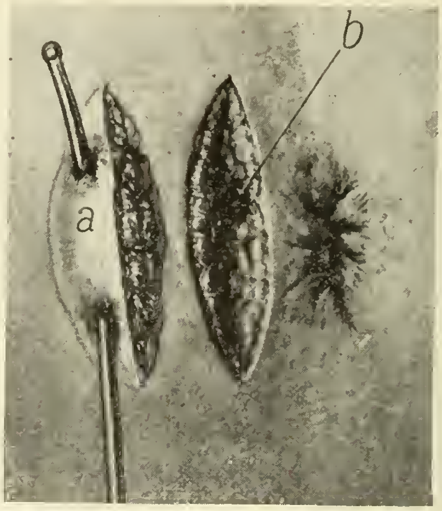


Fig. 9. One reason why fistulæ frequently do not heal after operation. Section (a) removed, but (b) the sinus to anal canal overlooked.

CONCLUSIONS

1. Tuberculous lesions about the anus and rectum occur secondary to a focus elsewhere in practically every case.

2. In our present series of cases perianal tuberculous skin lesions were found in 0.8 per cent of patients observed.

3. Perirectal abscess and fistula, in the same group, occurred in 5.8 per cent.

4. The more common types of perianal skin tuberculosis can be healed if properly treated.

5. Perirectal abscess and fistula in ano in the tuberculous patient present a typical history and clinical picture, and are undoubtedly all tuberculous in origin.

6. Properly treated surgically, these abscesses and fistulæ will heal in at least 90 per cent of cases; neglected, not more than 35 per cent become quiescent.

7. Surgical removal of these lesions relieves the body of the added work of trying to heal an additional tuberculous focus.

CARCINOMA OF COLON AND SIGMOID*

F. C. Schuldt, M.D.
Saint Paul

The one outstanding destroyer of human life, the cause of which has so far baffled medical science, is cancer. I have therefore chosen one phase of this disease as the subject of my address and shall take up carcinoma of the colon and sigmoid, dwelling upon its etiology, diagnosis and operative therapy.

I hesitate to add to the already voluminous American and European literature on the subject, but it is by repetition that impressions are formed. I shall base my remarks on five colon resections performed on four patients.

The proponents of preventive medicine are forever preaching to the laity the importance of recognition of early signs and symptoms. We read the admonition and subscribe to the doctrine. But too often a patient comes to us with more or less definite symptoms which have existed over a period of months and we advise a long period of observation before we consider the condition serious. It is unfortunate that the history of the patient so often reveals such an enduring patience with distressing symptoms both on the part of the patient and the physician. Tennyson said: "Knowledge comes but wisdom lingers."

ETIOLOGY

The cause underlying carcinoma of the large bowel is of course the cause of carcinoma found anywhere in the body. Rankin says: "Without an understanding of the etiology of carcinoma, one is wise to avoid attempting to explain the reason why in one place the disease is found comparatively frequently and in another infrequently."

Considering the duration of symptoms before a patient seeks relief or before the condition becomes alarming, we must draw the conclusion that we are dealing with a slow growing tumor. Turner pronounces carcinoma of the colon low in the scale of malignancy.

It is through the lymph terminals of the villi of the small intestine that the chyme is absorbed. The function of the cecum and ascending colon and a portion of the transverse colon is absorption of fluid from the liquid feces. The lymphatic system here is not nearly so extensive and metastases rarely occur.

The colon of the left side is mainly for storage; consequently the need of lymphatics here is negligible and we find a very sparse distribution of lymph nodes in the mesentery of the left portion of the transverse colon, descending colon and sigmoid. Due to the fact that there are very few lymphatic vessels, metastatic extension is unlikely and if it does occur is slowly progressive but is more likely to occur than on the right side.

Constipation is included among the causative factors, but in a careful history of a carcinoma patient the constipation is usually a consequence, not a cause.

Hayden and Shedden state that: "Constipation is so common an ailment that it can hardly be considered as an important etiological factor."

Schmidt and Von Noorden make the postulate that: "Every case of constipation in the carcinoma age should be suspected of carcinoma."

Kauffmann, commenting on this, says: "This does not work out in practice, since the percentage of carcinoma among the big array of constipated patients is negligible."

The physiology of the colon indicates that the fecal mass becomes firm in the transverse colon and hard in the descending colon and sigmoid. Polya says: "The mechanical irritation of hard dry masses impinging on the lining of the descending colon could be a causative factor." Physiology and roentgenology teach us that the descending colon rarely harbors feces long; it is merely a passageway. The cecum, receiving only liquid feces, is not subjected to this possible etiological factor.

Rankin briefly disposes of the relation of diverticulitis to carcinoma, saying: "Probably it is incidental rather than actual." Is it possible that the anatomical sphincters of the colon are a provoking cause for carcinoma? Multiple sphincters have been described. Opinions vary as to where the sphincters are. Lane declares one sphincter each in ascending colon, transverse colon, splenic flexure, descending colon, sigmoid and rectum. While Balli describes rather completely the sphincters of the colon, he designates three sphincters to the cecum and ascending colon, one each to the transverse colon, splenic flexure, colo-sigmoidal junction and in the terminal colon between sigmoid and rectum. There are no sphincters in the descending colon. Therefore the fecal mass does not remain long in the descending limb. A barium enema will soon leave this portion of the bowel while in a barium meal we rarely can visualize any content in the normal descending colon. True, the mass has been dehydrated and sometimes hard, but it passes through the left limb as if its only function were to provide an avenue for the mass to the sigmoid.

---

*Presidential address presented before the Ramsey County Medical Society, Saint Paul, Feb. 2, 1931.

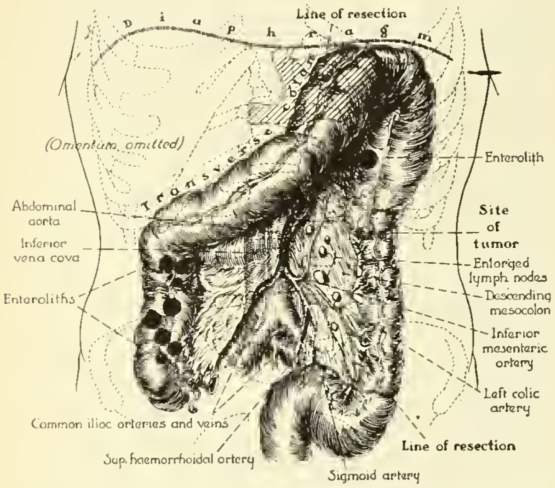

Diaphragm
Line of resection
Transverse colon
(Omentum omitted)
Enterolith
Abdominal aorta
Site of tumor
Inferior vena cava
Enlarged lymph nodes
Enteroliths
Descending mesocolon
Inferior mesenteric artery
Left colic artery
Common iliac arteries and veins
Line of resection
Sup. haemorrhoidal artery
Sigmoid artery

Fig. 1. Case 4. Drawing based on radiograms and gross pathology.

A possible forerunner to a cancer should be considered. Schmieden and Westhues, from the University Clinic of Frankfort, Germany, report on thirty-five cases of colon carcinoma, and in a comprehensive article review the much debated theory of the etiology of carcinoma origin from polyps. They classify polyps into three groups: (1) benign; (2) benign, some becoming malignant; (3) malignant.

Schmieden and Westhues were able to prove that of twenty-eight cases of cancer of the colon with operation sixteen had their origin from polyps. They came to this conclusion in that they either could demonstrate directly that the existing carcinoma had by configuration its origin from a polyp or that in the near vicinity to the existing carcinoma were other malignant polypi. This work of Schmieden and Westhues was corroborated by Aschoff. The grouping of the polyps depends on the differentiation of the cells in the polyp and their staining qualities. The cells of the glands stain much darker in group three and the epithelium is higher, while those in group one which are benign stain lighter. They state that a long pedicle does not determine the grouping, as a long pedicle polyp may fall into either group. "Adenomatous polyps constitute the most dangerous predisposing factor in the development of adeno-carcinoma," says Hayden and Shedden.

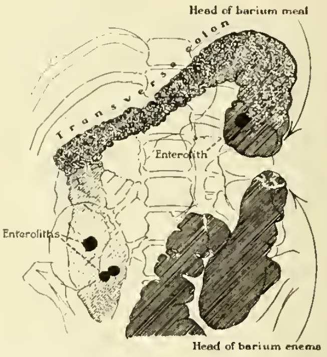

Head of barium meal
Transverse colon
Enterolith
Enteroliths
Head of barium enema

Fig. 2. Case 4. Shadowgram interpretation of radiogram.

Schmieden and Westhues report that on careful examination of resected segments additional polyps were found at times in great numbers, and they make the claim after an extensive study that inflammation is important in the etiology of polyps.

SYMPTOMS

The attitude presented in the history of the average patient is very often too optimistic about the gravity of his symptoms. Patients make light of a colicky pain of the past week or month, or, they say: "For the past month I have not been as regular as I used to be." In the light of knowledge one would say that at that time there may be present, with only such meager symptoms, an annular or cauliflower tumor in the left colon which may have existed for six months and is showing evidence not of a beginning, but rather advanced pathology.

Kauffmann puts it in these words: "Palpable tumor, colic, obstruction signs, microscopic blood and mucus in the stool are not early signs."

Rankin says, "Loss of weight, cachexia and dehydration are not symptoms of primary cancer, but of the metastases." So, among the early signs, remain only slight bowel irregularities and indefinite pain in the abdomen not related to food intake, activity, or time of day. Truly a meager program to work on. Similar colic on previous occasions, due to indiscretion in diet, will be remembered by the patient and he hopes to be better tomorrow. So weeks linger. As the tumor progresses its location becomes indicated.

Carcinoma in the cecum and ascending colon will produce a most profound anemia, a palpable tumor in the right abdomen and rarely obstruction. Tumors of the left side of the abdomen are not accompanied by anemia but by gradually increasing obstruction. Usually such patients eat well, but find themselves using every form of laxative.

Kohn says: "When the cancer involves the colon the symptoms are not ordinarily significant of the disease itself, and it is often difficult to make a diagnosis." The symptoms become exaggerated. Borborygmus is often present, at times an embarrassing audible rumbling. In a thin walled abdomen a visible peristalsis is evident. The stool may consist of hardened masses. There may be red blood present when the tumor is in the sigmoid or rectum. Mucus is present. When the tumor is in the rectum tenesmus is a dominant symptom.

After a period of months or years of partial obstruction the proximal colon becomes greatly distended and hypertrophied, assuming the dimensions of a colon in Hirschsprung's disease. Later the small intestines begin to balloon, and the space reserved for the stomach becomes diminished. Peristalsis continues either iso- or anti- and the situation is serious.

Rankin estimates that acute obstruction exists in 5 per cent of cases and that it sometimes comes without warning due to some complications such as abscess of the bowel wall, perforation of the bowel proximal to the tumor, or peritonitis due to a thinning out of the colon, permitting bacterial transmission.

DIAGNOSIS

The early symptoms of carcinoma of the colon are indefinite and frequently are not severe enough to cause the patient to seek advice. At times a mild abdominal pain comes in attacks which heretofore had not existed and a former regularity of the bowel is lacking, so that the patient's attention is directed to his welfare. The common fault lies in failing to look for a carcinoma when suspicion of its presence should be aroused by the history. Whether the patient is young or old and an ever increasing constipation with crampy pain in the lower abdomen is present, it is indeed wise to consult a physician. If the history of the patient indicates that the change in bowel habit has been over a period of months, then X-ray studies should be made, following the barium head in its progress and controlling the findings by a barium enema.

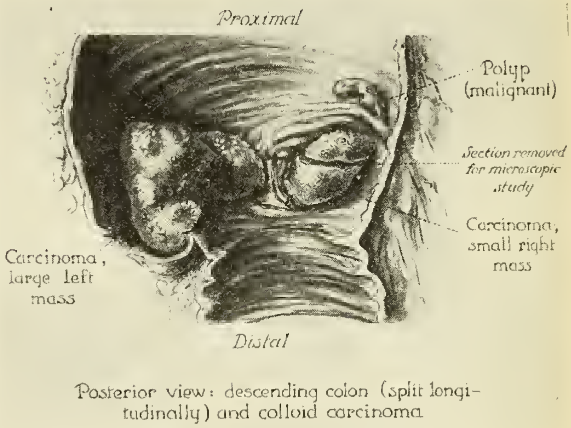

Proximal
Polyp (malignant)
Section removed for microscopic study
Carcinoma, small right mass
Carcinoma, large left mass
Distal
Posterior view: descending colon (split longitudinally) and colloid carcinoma

Fig. 3. Case 3. Drawing of specimen.

A bimanual rectal examination is very simple and should be made. This does not enable one to palpate the right or left limb of the colon, but it will map out a mass in the sigmoid. The urinary bladder should always be empty when making a bimanual pelvic examination, as this will often spare you much perplexity as to the presence of some soft tumor. Dr. John Deaver, at one of the International Assemblies, described in his characteristic manner how he spared a woman an operation by draining the tumor through a catheter in the urethra.

Proctoscopic examinations, in most instances, can now be done in the office with the newer lighted instruments. The patient should be well prepared. A sensitive or tight anus may require a local anesthetic before the proctoscope is inserted, but in the average patient there is no difficulty.

A bimanual examination is next made. Just as a prostate can be outlined from a bimanual examination, by repeatedly coaxing the patient to relax, so one may be able to detect even small masses in the pelvic colon if actual distention does not already exist.

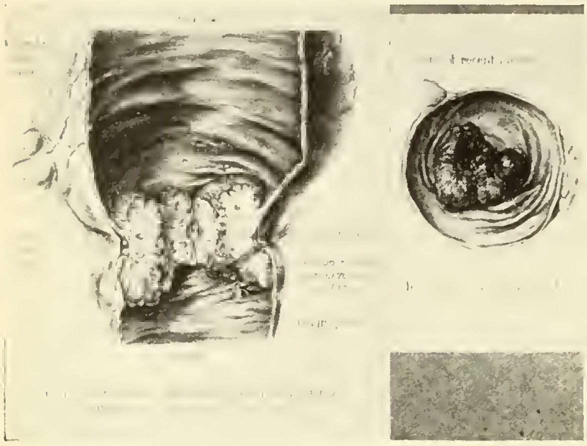


Fig. 4. Case 4. Drawing of tumor from specimen showing complete obstruction.

The barium enema is an invaluable method for determining a filling defect or an obstruction. The enema column is full and dense and can be watched, while in a barium meal we rely upon the goodwill of the colon to propel a full barium column. This does not always take place. It is broken up and widely scattered and gives one in many instances no clue, and no clue is a negative diagnosis. The literature reveals just such situations repeatedly.

The barium enema is without doubt the most valuable diagnostic procedure. In attempting to give a barium meal, we are often confronted by vomiting and anti-peristalsis and our purpose is defeated. Air filling of the colon may help localize a tumor.

In the literature grave warnings are expressed of the consequences of giving a barium meal in obstruction. I have never seen it do any harm.

At the Mayo Clinic a roentgen technic which originated in Schmieden's Clinic in Frankfort, is now used for diagnosing polyposis. This consists of giving a barium enema, then permitting the patient to completely empty the bowel and insufflating the colon with air. A lacy appearance of the colon shows clearly the outline of the polyps.

A barium enema may appear totally blocked at the point of obstruction when the obstruction is not actually complete, the tumor acting like a valve.

Some years ago Moynihan pointed out that irrespective of the site of the obstruction in the colon the cecum distends to a greater degree than any other part.

Just as a glycosuria is not always a diabetes, so also a blood picture of primary anemia is not always due to a pernicious anemia. Rankin says that: "No patient should receive a diagnosis of pernicious anemia until a thorough examination of the entire colon has precluded the possibility of a malignant growth in the right half." Schmieden incidentally found an eosinophilia of 7 per cent in rectal carcinoma and says that several authorities consider eosinophilia characteristic of polyps.

SURGERY

Whether the patient with a carcinoma of the colon or sigmoid is operable must be determined. Kauffmann reports 51 per cent of his cases inoperable. The site of the tumor with its symptoms determines the modus operandi.

In a general way there is a uniformity of thought as to the method of choice, but in some of the important details there is considerable variance. In approaching the surgery of colon carcinoma, I prefer to describe in detail the technic used in advanced cases which may be easily adapted to the earlier ones.

Rankin has simplified the preoperative measures thus: (1) attention to the general condition; (2) reduction of local infection; (3) colostomy; (4) spinal anesthesia.

The patient with carcinoma of the cecum will often have a profound anemia without obstruction, while in a left sided carcinoma a high grade of obstruction may be present. Antiperistalsis, nausea, vomiting, inability to take food or liquid, dehydration and acidosis may result from the obstruction, and hypodermoclysis of one to three quarts of 5 per cent glucose may be required as an emergency measure, taking away all liquids and food by mouth.

An exploratory operation is indicated to determine the extent and site of the tumor and metastases, and to institute relief for obstruction. Fortunately metastases are rarer than in gastric carcinoma.

Should metastases be extensive and the local involvement beyond hopes of removal, then the patient should be spared an unnecessary and ill advised attempt at removal and would live longer with a colostomy. Kauffmann says: "It is useless to operate in the presence of metastases or peritoneal involvement." Polya corroborates this view. Demonstrable involvement of lymph nodes offers a poor prognosis.

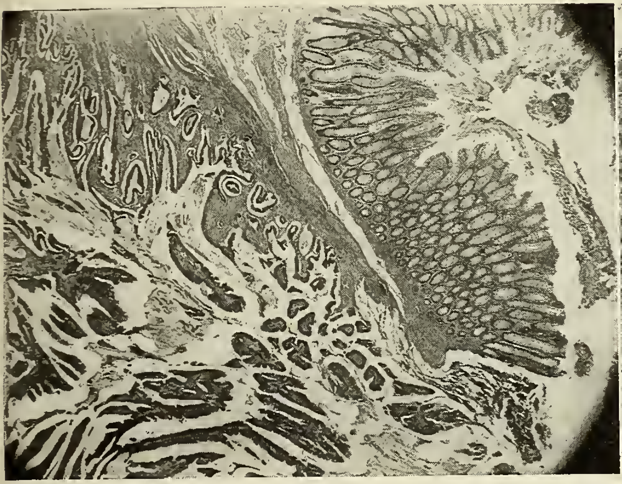


Fig. 5. Case 4. Microscopic section showing sharp borderline between normal and malignant structure.

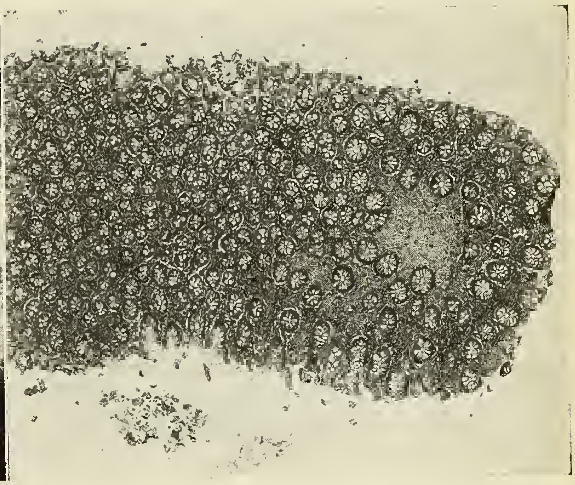


Fig. 6. Case 4. High power magnification of benign polyp.

Primary resection in the presence of ileus is, according to Kauffmann, an operation equal to murder, having a mortality of 80 per cent. Wide resection must be made. Whereas in gastric carcinoma a one inch margin beyond the tumor is rather safe, this does not hold true for the colon.

In a carcinoma of the splenic flexure and descending colon, the left third of the transverse colon, the splenic flexure and the descending colon to the region of the sigmoid junction should be removed. Horsley has advocated this resection. There must be absolutely no tension on the suture line. The ascending or descending colon is readily mobilized by cutting the parietal peritoneum on the outer side. Lifting the colon medianwards, the mesentery is readily presented and enlarged lymph glands can be located. A triangular segment of the mesentery is removed with the segment and the gap carefully sutured. The proximal and distal ends are now sutured end-to-end.

We all agree with Polya that the suture of the large intestine is much more difficult than that of the small bowel because of its blood supply and thin wall. In addition it has annoying fatty appendages and wide mesenteric attachments. Polya uses the appendages to reinforce the suture line. With obstruction, there is always a great difference in the lumen above and below the obstruction.

Polya advocates the open method, cutting the bowel with a knife, sponging the mucus from the open bowel and then suturing. On the right side the end-to-side anastomosis of ileum to transverse colon overcomes the difference in lumens. Polya reports leaving the transverse colon end on the exterior for relief from gas. This method caused an intestinal strangulation in one clinic and was discontinued.

Mikulicz, for twenty years in the Breslau Clinic, advocated his well known exteriorization method. Kauffmann reports that results in primary resection, since Kuettner has been there, have been so successful that in well chosen cases the Mikulicz method is not used.

Bell is of the opinion that the Mikulicz operation should be abandoned, except where gangrene of the bowel exists, owing to the long period of hospitalization, high percentage of recurrence, danger of thrombosis in vessels and postoperative herniation.

Rankin reports in a series of cases a 12 per cent recurrence in the incision with the Mikulicz technic, so he has devised a modification. He applies his two bladed clamp to the proximal and distal segments of the bowel, removes the loop, closes the rent in the mesentery, sutures the peritoneum around the segments, leaving the clamp on forty-eight to sixty hours without disturbance to the patient. No food is given by mouth, but glucose subcutaneously is administered. After sixty hours the proximal blade is opened, gas is permitted to escape, and in a week the clamp falls off the distal end. The spur is cut as in the Mikulicz operation. In one-half of the patients the bowel closes spontaneously. In a closed end-to-end anastomosis the colostomy may be closed in three weeks.

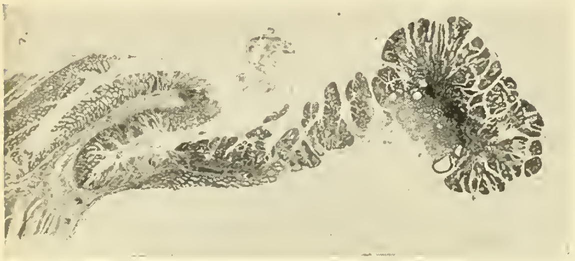


Fig. 7. Case 3. Low power magnification of malignant polyp.

Diet following operation is important and should contain food low in residue and rich in carbohydrate value. Samson Wright, in applied physiology, states: "The feces are not derived to any extent from ingested food, but mainly from the secretions of the alimentary canal. The feces of starving animals do not differ in composition from those of normally fed animals, but are less in amount.

PROGNOSIS

Kauffmann estimates a mortality of 53 per cent in cases of carcinoma of the colon with obstruction, following preliminary operation and resection.

Kauffmann hopefully says that: "Metastases are seldom after three years." Other authors say five years. Turner feels that the mortality has been halved since preliminary operation has been adopted.

Turner and W. J. Mayo advise wide resection even if metastases are present, saying that metastases progress much slower when the primary tumor is out.

Schmieden and Westhues determined that in one instance a recurrence in six months was due to a malignant polyp proximal to a previously excised carcinoma, since metastases do not have a tendency to form an annular constriction.

CASE REPORT

Case 1.—Mr. M., aged 63, was first seen August 22, 1921. The patient complained of a rather sharp pain in the abdomen of a month's duration. His abdomen has not been right for the past four years. His appetite has been good, but he has been very constipated. There has been a loss of ten pounds in the past month. Following severe abdominal cramps he has passed black stools.

All physical findings were negative. A bimanual rectal examination was not possible as the anus was very tight. Following the perianal injection of novocain a bimanual examination was easily made and we could make out a large mass in the left pelvis.

Impression: (1) carcinoma of sigmoid; (2) diverticulitis.

Upon operation under ether on August 31, 1921, a large tumor mass was found in the pelvis. It was freed with difficulty and lifted entirely out of the abdomen. Primary resection seemed so feasible that the mass was removed and an end-to-end anastomosis done. A colostomy of the proximal loop was made. A segment of twelve inches was resected, and there was no tension on the suture line.

Microscopic section showed an adenocarcinoma. On gross section we also found considerable inflammatory involvement and a pus pocket in the wall of the thickened bowel.

The patient bore the operation well and by the twentieth day had natural formed stools.

In June, 1922, optic atrophy made its appearance. The Wassermann test was found to be negative and X-ray therapy was instituted.

In May, 1925, the patient began having intermittent hematuria, occurring for a day every two weeks. There was no pain nor frequency, but blood clots passed. This condition was not reported until May, 1926, when a cystoscopic examination showed an ulcer near the dome of the bladder.

Diagnosis: Carcinoma metastasis.

A series of X-ray treatments was given during May, June and July and in August cystoscopic examinations showed the ulcer to have diminished in size. By December the patient had gained twenty pounds and had noticed hematuria only once since July.

In January, 1931, he was failing rapidly although a barium enema showed no bowel involvement. Since the reading of this paper he became extremely exsanguinated from his hematuria and death ensued.

Case 2.—Mrs. M., aged 73, was first seen July 16, 1926.

The complaint was of quite a severe pain in the left lower quadrant accompanied by rumbling and gurgling noises in the abdomen for the past three months. Constipation had been present for the past two months with absolute obstipation for two days. The appetite had been fair but her health had been failing for the past six months and she had lost some weight. There had been no diarrhea.

Vaginal examination was negative. A barium enema showed obstruction in the mid-portion of the descending colon. A barium meal, forty-eight hours later, showed the head of the column in the mid-portion of the descending colon.

Upon operation under ether on July 20, 1926, a mass was found in the distal end of the descending colon. This was freely movable and could be lifted out. There was not much distention of the intestines present. Resection was made one inch on each side of the mass and an open end-to-end anastomosis made. As there was no tension on the suture line and the anastomosis seemed satisfactory no colostomy was done. One week later some fecal discharge developed at the line of the anastomosis, but soon closed. X-ray therapy was instituted in April, 1927.

In May, 1927, a hard nodule was present at the site of the operation. Opening this resulted in a fecal fistula. A colostomy bag was worn and the patient felt improved.

By July a large abscess had formed near the site of the original incision and the carcinoma had spread all through the incision.

Death occurred on July 6, 1928, from metastases in the liver.

Case 3.—Miss C., aged 35, single, complained of pain in the abdomen, constipation and intestinal cramps. The constipation had been present since January, 1928, but was relieved by mineral oil.

An X-ray laboratory reported the bowel normal. The condition grew progressively worse so that cathartics and enemata failed to act. Examination in our laboratory showed an obstruction in the descending colon. On operation, March 30, 1928, an annular cauliflower mass the size of a walnut attached by a broad base was found completely obstructing the lumen. Microscopic examination showed the presence of an adenocarcinoma.

A segment of the colon near the sigmoid was resected which included about one inch of intestine on each side of the tumor mass. The patient remained entirely without symptoms for two years, when there was a recurrence at the site of the anastomosis larger than the primary tumor and obstructive in character. The patient, a very intelligent young woman, declared in no uncertain terms that the colicky pain and disturbed bowel habit were again identical with the symptoms she had had before, which in the interim had all disappeared.

An extensive resection following a cecostomy was carried out in October, 1930. We found a recurrence with two distinct tumors, one a large cauliflower mass with a small base which on section exhibited the coniferous tree-like design with its individual pedicle (Fig. 3). Healthy mucosa existed on each side of each tumor. This appears clearly in the drawing. It was of great interest to me that we found proximately a polyp with a pedicle 2.5 cm. long on a healthy base (Fig. 7). This was pronounced by Dr. E. T. Bell as near-malignant and belonging in group three of Schmieden and Westhues.

Case 4.—Mr. C., aged 33, was first seen July 20, 1930. His complaint consisted of hiccoughing, pain in the epigastrium, a general soreness of the abdomen, and recent constipation. For the past three days he has had a severe crampy pain in the left abdomen with obstipation, hiccough, nausea and vomiting of green and brownish material. For two years he had suffered from an increasing constipation, without attacks of diarrhea. For three months there had been a gurgling and rumbling in the bowels. The abdomen was rounded, but did not give the impression of any marked distention. No red blood was noticed in the stool. In the hospital the hiccough persisted.

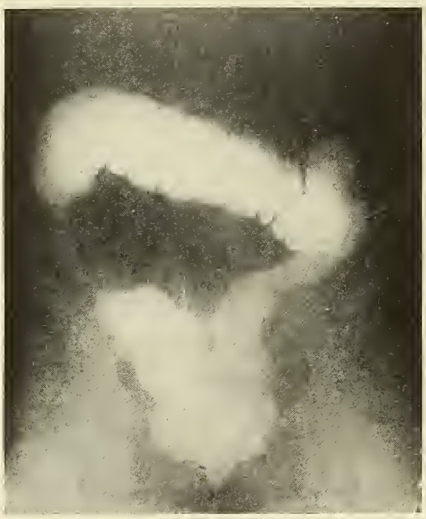


Fig. 8. Case 3. Barium enema after resection of left third of transverse colon and all of descending colon. Ascending colon shows spasm of colostomy due to closure ten days before.

The patient was in much distress from the hiccough and frequent vomiting, sometimes of dark blood. Glucose had to be administered intravenously to counteract acidosis.

In this particular instance his symptoms all pointed to a gastric lesion and our attempt was to visualize the stomach. To add to our confusion the stomach was deformed and situated extremely high. An irregular filling defect could not be interpreted. The esophagus was filled and remained filled for six hours. The first ray of light came when the jejunum appeared to be severely distended and ileum, cecum, ascending colon and transverse colon were found successively to be displaced and greatly ballooned. The transverse colon was situated anterior to the stomach. The head of the barium column finally halted in the upper part of the descending colon (Fig. 2). To verify our findings the barium enema head came to rest within a half inch of the meal head. A dense shadow three-fourths of an inch in diameter in the upper left abdominal quadrant was freely movable (Fig. 1). In the lower right quadrant there was a group of dense shadows, nine in all. The first radiograms revealed a severe jejunal distention, and later radiograms showed also distention of the ileum and colon to a high degree. After twenty-four hours the stomach rugæ still retained barium and the head of the meal was in the descending colon.

For two years the patient had sought medical advice and was graciously recommended to take another laxative each time he came for relief of his symptoms. No

X-ray examination had been done. I believe we are justified in recommending X-ray examinations, not only in such advanced cases, but on suspicion of trouble.

Diagnosis: Carcinoma high in the descending colon.

A preliminary cecostomy was performed on July 26, 1930, under spinocain. A mass was found in the descending colon (Fig. 4).

On August 8, under spinocain, resection of the left third of the transverse colon, the splenic flexure and the descending colon was made to near the sigmoid. The left colic artery and the glands were resected with the mesentery. A number of enlarged lymph glands were encountered, one at the apex of the mesenteric triangle to be removed at the junction of the left colic artery with the mesentery. This gland was removed individually and later proved to be malignant. The liver was free and no other metastases were seen or felt. An open end-to-end anastomosis was made. The dense shadows proved to be hard enteroliths.

I believe every lymph gland in the left mesentery was involved (Fig. 1). There were about six glands the size of a pea and the most proximal at the apex of the triangle of mesentery was completely involved with colloid cancer.

In the gross specimen the tumor was an annular type completely obstructing, and about 3 cm. distally from the tumor was a small polyp 1 cm. high on a healthy base which on section was benign (Fig. 6).

Convalescence was stormy for a time due to severe griping abdominal pain. The intestinal suture line held well and his stomach and bowel function became normal.

The cecostomy was closed on August 29, and, aside from some griping, convalescence was uneventful and the patient went to work as engineer on October 15. By November he weighed 156 pounds, having gained 17 pounds in two months.

BIBLIOGRAPHY

1. Balli, R.: The sphincters of the colon. Radiology, 12:484-495, 1929.
2. Bell, Leo P.: Carcinoma of the large bowel not including the rectum and the recto-sigmoid. Arch. of Surgery, 20:491-507 (March), 1930.
3. Bird, Clarence E.: Editorial. Surg., Gynec. & Obstet., 51:738 (November), 1930.
4. Carman, Russel: Roentgenologic signs of cancer of the colon. Jour. of Radiology, 4:147-151, 1923.
5. Greenough, Robert: Editorial. Surg., Gynec. & Obstet., 51:561 (October), 1930.
6. Hayden, E. Parker, and Shedden, William M.: Carcinoma of the rectum. Surg., Gynec. & Obstet., 51: 783-798 (December), 1930.
7. Horsley, Shelton: Operative Surgery. P. 766. C. V. Mosby, 1928.
8. Kauffmann, Helmuth: Über dickarm karcinom. Bruns' Beiträge zur klinischen Chirurgie. Band 142:784-794, 1928.
9. Kohn, L. Winfield: Practical Treatise on Diseases of the Digestive Tract. Vol. 2. Davis, 1930.
10. Lane, W. A.: Cancer of the colon, its causation and treatment. Lancet, 2:114-1189 (Dec. 11), 1920.
11. Moynihan, B. G.: Surgical treatment of malignant diseases of the colon. Lancet, 2:1252 (Dec. 18), 1920.
12. Newton, Allan: Carcinoma of the colon. New Zealand Med. Jour., 28:83-97 (April), 1929.
13. Ochsenhirt, Norman C.: The significance of mucus-forming cells in carcinoma of the large intestine and rectum. Surg., Gynec. & Obst., 47:32-35, 1928.
14. Pochammer, C.: Ü. besondere Schnittführung bei d. Radikaloperation der Dickdarmkrebse. Arch. f. klin. Chir., 145:268-279, 1927.
15. Polya, Eugen: Operation for carcinoma of sigmoid. Surg., Gynec. & Obstet., 50:733-740 (April), 1930. Translation.
16. Rankin, Fred W.: Carcinoma of the small bowel. Surg., Gynec. & Obstet., 50:939-947 (June), 1930.
17. Rankin, Fred W.: Resection and obstruction of the colon. Surg., Gynec. & Obstet., 50:594-598 (March), 1930.
18. Rankin, Fred W.: The diagnosis of malignant conditions of the colon. Minn. Med., 13:796-802 (November), 1930.
19. Schmieden, V., and Westhues, H.: Zur Klinik u. Pathologie der dickdarm Polypen u. deren klinischen u. pathologish anatomischen Beziehungen zum dickdarm Karcinom. Deutsch. Ztschr. f. Chir., Band 202:1-124, 1927.
20. Turner, G. G.: Cancer of the colon. Lancet, 1017-1023 (May 18), 1929.
21. Wright, Samson: Applied Physiology, Oxford Univ. Press., 1929.

ACUTE MECHANICAL OBSTRUCTION OF THE LOWER BOWEL*

James A. Johnson, M.D.
Minneapolis

Much confusion has arisen in the past from a too general consideration of intestinal obstruction, without regard to the importance of its location. The symptoms, treatment and prognosis may vary greatly in relation to the type and location of the obstruction. I shall consider here only the mechanical variety, located in the lower ileum and colon. For purposes of analysis the types will be classified as: (1) simple, (2) strangulated, (3) complete, and (4) incomplete.

In simple obstruction there is no material interference with the blood supply. It most often occurs high in the canal, as in obstruction to the pyloris or duodenem by carcinoma, congenital bands or cicatricial contractions. It may also be found in the lower bowel, but if allowed to progress in this location, will nearly always cause interference with the circulation and go on to strangulation. The cases of simple obstruction occurring in the lower bowel are usually the result of growths and foreign bodies, such as gallstones. If the block is complete, strangulation may occur early because of extensive bowel distention.

In obstruction with strangulation there is a definite interference with circulation. Such cases usually result from bands, hernia, or intussusception, where there is a more or less complete blocking of the circulation early in the obstruction. As a rule in obstruction with strangulation the condition is more serious, and the mortality is much higher than in cases of simple obstruction.

The complete and incomplete types of obstruction are self-explanatory. Some are complete at their onset, but many begin as incomplete and later become complete. It is obvious that the more complete an obstruction is, the more serious is its outlook.

The location of the obstruction is an important factor. In the upper bowel obstruction the toxemia is not so great as in the lower. The chief difficulty in this type lies in the fact that the patient begins to vomit early, and therefore rapidly becomes dehydrated, and loses his chlorides. If the condition is not recognized early, dehydration, hypochloremia and starvation may cause a rapid termination. Today, however, because of the almost universal understanding and application of the principles of blood chemistry, these cases do not present so serious a problem. The proper administration of water, sodium chloride and glucose will control the danger factors for a long period of time.

In lower bowel obstruction, in addition to the above factors of dehydration, hypochloremia and starvation, there is the added dread of strangulation, toxemia and peritonitis. An obstruction in this location is often insidious in its onset and grave symptoms may not appear until toxemia and even peritonitis are well advanced. For these reasons the mortality is extremely high and the condition should be considered as a separate entity.

With these points in mind, the author has made an analysis of thirty-six consecutive cases of lower bowel obstruction occurring in his private practice during the nine years from January, 1921, to January, 1930. The cases chosen were from private practice, and they received daily, personal observation.

In Table I the cases have been tabulated as to cause, type of obstruction, type of operation and result. Only the cases in which there was a marked interference with circulation were classified as strangulated. In the cases due to inflammatory adhesions, only one was recorded as strangulated. Some of the others may have been, but since only an enterostomy was done, no accurate observations could be made. Thirty-one of the obstructions occurred in the lower ileum and five in the colon.

Table II is a summary of Table I, showing a mortality of 11 cases out of the 36, or 30.55 per cent. A detailed analysis of the mortality is given in Table VI.

It is a well known fact that previous opera-

---

*From the Department of Surgery, The Nicollet Clinic. Read before the Minnesota Academy of Medicine, Dec. 10, 1930.

TABLE I

NO. OF CASES	CAUSE OF OBSTRUCTION	NUMBER OF OPERATIONS	TYPE OF OBSTRUCTION	TYPE OF OPERATION	DIED	RECOVERED
16	Bands of adhesions	15 (1 not operated)	Complete 14 Strangulated 14 Incomplete 2	Release of obstruction 8 Release of obstruction and enterostomy 7 Enterostomy only 1	7	9
5	Intussusception	5	Complete 5 Strangulated 5	Reduction of intussusception 3 Resection of bowel 2	2	3
6	Inflammatory adhesions	6	Complete 6 Strangulated 1	Relief of obstruction 1 Enterostomy 5		6
3	Carcinoma of descending colon	3	Complete 3 Strangulated 1	Resection of carcinoma and colostomy	1	2
2	Complete atresia of colon and ileum Meckel's diverticulum	2	Complete 2 Strangulated 1	Resection of bowel 1 Relief of obstruction and resection of diverticulum 1	1	1
1	Volvulus of colon with band of adhesion	1	Complete 1 Strangulated 1	Relief of obstruction and enterostomy		1
2	Hernia Inguinal hernia Hernia of ileum through broad ligament	2	Complete 2 Strangulated 2	Obstruction relieved 2		2
1	Apricot in ileum	1	Complete 1	Apricot removed and enterostomy		1

TABLE II

NO OF CASES	TYPE OF OBSTRUCTION	TYPE OF OPERATION	CASES OPERATED	NOT OPERATED
36	Complete 34 Strangulated 25 Incomplete 2	Relief of obstruction 14 Relief of obstruction and enterostomy 9 Enterostomy only 6 Resection of bowel 3 Resection of growth and colostomy 3	35	1
			DIED	RECOVERED
			11 (30.55%)	25

tions play an important part in the development of acute mechanical obstruction. This is illustrated in Table III. Of the 36 cases tabulated, 20 (55.5 per cent) were the direct result of previous operations on the pelvic organs or the lower bowel.

Table IV shows the number of hours or days that symptoms of obstruction were present before operation. It is impossible to state in a particular case just when an obstruction becomes complete. Some of the cases were undoubtedly incomplete at the onset. Three could definitely be recognized as of gradual onset and were incomplete for a considerable period of time. One was gradual and incomplete. The number of cases is too small to draw any definite conclusion as to the relation between duration of symptoms and mortality; but it is a recognized fact that the longer the duration, the higher the mortality. The above tabulation verifies this statement.

Enterostomy is now considered one of the most important life saving measures in advanced cases of bowel obstruction. A separate analysis has therefore been made of those cases in which enterostomy was performed, giving duration and type of obstruction, together with the condition of the patient and results obtained. It will be noted by studying Table V that all the cases were advanced and the condition serious. Many of these patients would undoubtedly have died had not enterostomy been done. Of the fifteen patients operated upon, only three died (20 per cent); two from general peritonitis and one from lobar pneumonia.

TABLE III

Previous Operations as a Causative Factor

Suppurative appendicitis with drainage	7
Hysterectomy	3
Ovarian	3
Retroversion	2
Simple appendectomy	1
Chronic salpingitis	1
Sigmoidostomy	1
Carcinoma of the colon	1
Enterostomy	1
TOTAL	20

(Of these, seven cases occurred during post-operative convalescence.)

Of the cases in this series which resulted in death, two were due to general peritonitis which was present at operation, one being of three and the other of four days' duration. One patient died from peritonitis or toxemia. This was an out-of-town patient, and could not be observed; but if an enterostomy had been done and proper postoperative care given, the patient would probably have lived. One died from peritonitis, and had a complete paralytic ileus. Only an enterostomy was done. One died from toxemia and operative shock, the obstruction being of four days' duration, and the patient almost pulseless when first seen. Operation was no doubt a useless procedure.

One patient had a paralytic ileus for five days. He had a severe asthma and myocarditis. No operation was done. Postmortem examination showed that a band had obstructed the descending colon. The obstruction was complete, but there was no damage to the bowel or signs of peritonitis. Postmortem examination of the chest was not permitted, but the death was clinically a cardiac one. An early enterostomy would probably have prevented this patient's death.

In one patient with a long-standing myocarditis, an incomplete obstruction was relieved, and gas and stool were freely passed. Death occurred four days after operation, and was due to cardiac failure.

Another patient was relieved of the obstruction; the enterostomy tube drained freely and the distended abdomen returned to normal; but he died three days after his operation from extensive lobar pneumonia, as proved by postmortem examination.

Three patients died from shock following operation. Two of these were eight and nine months old respectively, and had an intussusception of the ileum into ileum, with complete gangrene. Resection and anastomosis were done. One died twenty-four hours and the other three hours after operation. The third patient, a child three days old, had complete congenital atresia of the colon and lower ileum. Resection was done, but the child died twenty-four hours later.

TABLE IV

Duration of Obstruction in Relation to Mortality

HOURS DURATION	NUMBER CASES	DIED	PERCENTAGE
6 to 12 hours	0		
12 to 18 hours	1		
24 to 36 hours	3		
36 to 48 hours	10	4	40
48 to 60 hours	3	1	33.3
60 to 72 hours	10	3	30
4 days	4	2	50
5 days	2	1	50
6 days	1		
7 days	1		
Gradual, incomplete	1		

MORTALITY

In 1925 Tuttle[1] compiled a list of the mortality rates given by various observers. These were as follows: J. M. T. Finney, 36 per cent; C. T. Horine, 40 per cent; C. L. Scudder, 60.4 per cent; St. Thomas Hospital, London, 58 per cent; E. P. Richardson, 41.5 per cent; Guillaume, 63.2 per cent; Deaver and Ross, 42 per cent; C. L. Gibson, 43.2 per cent. The mortality rate in Tuttle's own group of cases was 50 per cent. Holden,[2] in a survey of 135 cases of all types in 1926, gave a mortality rate of 19.2 per cent.

In my series of cases I found the mortality rate to be 30.55 per cent. Of the patients who died, eight died as a direct result of the obstruction (22.2 per cent), two from heart complications (who would otherwise no doubt have lived), one from lobar pneumonia. Ten were completely obstructed, one incompletely (pneumonia death), seven were strangulated, one was no doubt strangulated, but since only an enterostomy was done no accurate information could be obtained; one, not strangulated, had a cardiac

TABLE V
Cases in Which Enterostomy Was Performed

NO. OF CASES	DURATION OF OBSTRUCTION		TYPE OF OBSTRUCTION		CONDITION OF PATIENT		DIED
15	36 hours	2	Complete	15	Marked toxemia	15	3 (20%)
	48 hours	5	Strangulated	10	Stercoraceous vomiting	11	2 from peritonitis
	72 hours	5			Bowel cyanotic with dark spots—free bood—stained fluid	10	1 from lobar pneumonia
	4 days	2			Peritonitis	5	RECOVERED
	7 days	1			Gangrene with peritonitis	1	12

TABLE VI
Analysis of Deaths

HOURS DURATION	TYPE	CONDITION OF PATIENT	TYPE OF OPERATION	AGE	SEX	CAUSE OF DEATH
72	Complete Strangulated	Very poor — peritonitis, stercoraceous vomiting (Lower ileum)	Resection and enterostomy	72	F	General peritonitis 4 days postoperative
72	Complete	Very poor (Congenital atresia colon and ileum)	Resection	3 days	F	Shock 24 hour postoperative
36+	Complete Strangulated Gangrene	Very poor pulse 150-200 temp. 102 (Intussusception of ileum into ileum)	Resection and anastomosis	9 mos.	F	Shock 24 hour postoperative
36+	Complete Strangulated Gangrene	Poor (Intussusception of ileum into ileum)	Resection and anastomosis	8 mos.	M	Shock 3 hour postoperative
50	Incomplete	Very poor, old cardiac case (Band obstructing lower ileum)	Relief of obstruction	65	M	Heart failure 4 days postoperative
4 days	Complete Strangulated	Very poor, general peritonitis (Carcinoma of descending colon)	1st stage Mikulicz tube in proximal loop	30	M	General peritonitis 14 days postoperative
72	Complete Strangulated	Very poor, bloody fluid, gangrene bowel (Lower ileum by adhesions)	Obstruction relieved	16	F	General peritonitis 3 days postoperative
5 days	Complete	Very poor (Descending colon obstructed by band)	Not operated	60	M	Paralytic ileus Chronic myocarditis 5 days postoperative
48+	Complete	Very poor, peritonitis, no peristalsis (Lower ileum by adhesion)	Enterostomy	31	F	Peritonitis, paralytic ileus 24 hour postoperative
4 days	Complete Strangulated	Very poor, almost pulseless (Lower ileum adherent to uterus)	Relief of obstruction	45	F	Toxemia and shock ½ hour postoperative
36+	Complete Strangulated	Poor, aged (Lower ileum obstructed by band)	Relief of obstruction and enterostomy	79	M	Lobar pneumonia 3 days postoperative

death, and one had congenital atresia of the bowel and died from shock. With the exception of the last case mentioned, all of the patients that died as a direct result of the obstruction (22.2 per cent) were strangulated.

The death rate from this condition depends largely upon the type of the obstruction and its duration. The rate is high in cases with strangulation. The greater the area of strangulation, the more serious the outlook will be. In this type early operation is of great importance. Delay is no doubt the greatest single factor to account for so high a mortality. It is probably safe to assume that if operation could be undertaken before profound toxemia and peritonitis develop, the mortality rate could be brought below 10 per cent.

CAUSES OF DEATH

Much has been written and many opinions expressed as to the cause of death in acute bowel obstruction. The usual expression is, "The patient died from toxemia." There is no doubt that the term "toxemia" has been used to include a multiplicity of causes which to many of us have not been entirely clear.

The various causes of death can be grouped into three classes: (1) changes in blood chemistry; (2) strangulation and shock; (3) toxemia and peritonitis.

The changes in blood chemistry are: (1) dehydration and loss of sodium chloride, due to vomiting, resulting in acidosis or alkalosis; (2) starvation from lack of food intake; (3) an increase in urea and non-protein nitrogen from toxic absorption and lack of elimination. In all probability some deaths in the past could be traced directly or indirectly to these causes. (McIver and Gamble[3] by experimental data have reached the same conclusion.) None of these changes is rapid, except in high obstruction, and with the proper administration of water, sodium chloride and glucose should not occur in a sufficient degree to cause death.

Clinically, it has long been recognized that when a large section of bowel is suddenly and completely strangulated, a rapid severe shock often follows. This has been proven experimentally by Foster and Hausler,[4] who even claim shock as a primary cause of death. Severe shock from strangulation is well illustrated in two of the above cases in which sudden extensive complete strangulation took place from intussusception of a large section of ileum into ileum. There was only slight dilatation of the bowel and no sign of toxemia or peritonitis, yet there was profound prostration and both patients died shortly after the operations from the added shock. Shock phenomenon following sudden interference with circulation is not confined to lesions of the intestinal tract. It is well exemplified in cysts with twisted pedicles and emboli blocking mesentery, lungs and extremities.

Toxemia and peritonitis are the causes of death in practically all cases of lower bowel obstruction. Let us consider what happens when the bowel is mechanically blocked. First, peristalsis is increased in an effort to relieve the obstruction. Bowel contents and gas cannot pass and dilatation takes place. As this continues, dilatation becomes more marked and there is a constantly growing accumulation from ingested fluid and intestinal secretions, all of which, in its stagnant condition, becomes a good culture medium for anaërobic intestinal bacteria. As accumulation continues, dilatation progresses, so that peristalsis becomes weaker. There is interference with circulation, the bowel looks cyanotic and dark spots appear, due to rupture of muscle fibers and smaller vessels or areas of thrombosis. During this stage considerable free fluid appears in the abdomen. Peristalsis grows weaker and finally disappears. The bowel is covered with gangrenous areas and leakage of the toxic contents takes place, general peritonitis develops, and we have the terminal stage of bowel obstruction.

The absorption of the toxic contents of the bowel has long been considered the cause of death. Many investigators have attempted to isolate a toxin or an organism responsible for this. Bower and Clark[5] state that of the few anaërobes found in the intestine, the *Bacillus welchii* is the only one that produces a toxin. In an obstructed bowel it multiplies rapidly and is supposed to account for a large amount of the gas distention. It causes a profound toxemia, much resembling that of gas gangrene. Bower and Clark treated twenty-five cases with an antitoxin from the *Bacillus welchii,* and believe they noticed much clinical improvement from its use. However, McIver and White's experimental observations[6] showed large numbers of the *Bacillus welchii* in the obstructed loops, but they could not ascribe toxemia to their presence. Foster and Hausler[4] strained the content of an obstructed bowel through gauze, and injected it intraperitoneally into dogs. The dogs became quite sick, but none died. Wangensteen and Chunn[7] injected filtrates from the contents of obstructed bowel and from normal bowel intraperitoneally into dogs, and proved that all intestinal filtrates are toxic; but they are not any more toxic from the obstructed than from the normal contents.

My clinical observations have been that an obstruction, if simple and without any strangulation, may be present for several days without much evidence of toxemia. The bowel may be very much distended, and contain large quantities of toxic fluid, yet the patient's general condition may be good. If the obstruction, however, progresses to strangulation, the picture is quite different; there is general prostration, the pulse grows weak, there is cold perspiration and cyanosis and the patient is profoundly ill. The general condition of the patient seems to depend upon the extent of the strangulation, and not on the amount of toxic material in the bowel. In some instances, strangulation can be so gradual that it does not produce the above symptoms. This is well illustrated in one of the cases cited. A patient with a carcinoma of the descending colon had symptoms of obstruction for a month, and had been completely obstructed for five days, yet he walked into the office and did not seem very sick. He was operated upon within a few hours. The colon and ileum were tremendously dilated and covered with necrotic areas through which the bowel contents were leaking into the abdomen. He had purulent peritonitis.

It is the acute strangulated case which presents the early profound toxemia. The more extensive the strangulation and the more quickly it develops, the more profound the toxemia will be. It is quite probable that we often confuse the prostration resulting from an extensive progressive strangulation with the toxemia which we suppose results from accumulations in the bowel. As strangulation progresses, so does toxemia. It is, therefore, quite reasonable to assume that the toxemia we often speak of as due to absorption of toxic material from the bowel contents is in reality due to the toxicity which arises from a progressing strangulation. As strangulation progresses, peritonitis develops, and gives us the final picture of death.

SYMPTOMS AND DIAGNOSIS

Pain is invariably the first symptom. It is intermittent and of a colicky nature, with intervals of rest. It is due to peristalsis attempting to force the bowel contents past the obstruction. As the bowel becomes over-distended and loses its contractibility, pain becomes continuous.

Shock is often marked at first in the acute mechanical type, especially when strangulation occurs early, as in intussusception. The primary shock may disappear, but will reappear as strangulation progresses.

Vomiting may occur early when obstruction is sudden and complete. It is usually a late symptom in lower bowel obstruction, and depends on the amount of fluid ingested. In most cases it does not occur until the bowel is over-distended and reverse peristalsis sets in. It is then an overflow, regurgitating type.

Abdominal distention is earliest and most pronounced in the loose, flabby abdomen. It is less evident and often misleading in the young muscular individual. It is difficult to estimate in the obese. In high obstruction, it is usually absent.

Fever and leukocytosis are absent in all non-inflammatory types at first, but appear as leakage takes place and peritonitis develops.

Obstipation is often misleading in obstructions above the colon. The first two enemas may bring good results of gas and stool from the colon below the block. This tends to confuse diagnosis and leads to delay if not properly evaluated.

The stethoscope has been a valuable aid in diagnosis. The peristaltic waves forcing gas and contents onward produce quite a characteristic sound. The gas as it passes on through the loops produces a gurgling sound, and when it meets the obstruction there is often quite a commotion. Either it passes through the obstruction with a rush, or is forced back up the bowel with a piping, blowing sound. The site of the obstruction can often be located in this way. The fluid passing through the loops produces a tinkling, metallic sound quite characteristic of obstruction.

The X-ray has great practical value in diagnosis. This has been recognized for a long time, but has not had general application. Normally, there is not enough gas in the small bowel to be recognized with the X-ray. In obstructions in the ileum, collections of gas can often be seen quite early. Later, as the bowel becomes distended, it assumes a horizontal position in the abdomen and the gas shadows have a "step ladder" arrangement, as described and illustrated by Case.[8]

In obstruction of the colon, large gas collections can often be seen in the proximal loop, stopping abruptly at the block. If a colon obstruction is suspected, a barium enema should be given to prove and locate it. This is especially valuable in elderly people who have had no previous operations, since it is likely to be due to malignancy, and its location is valuable to the surgeon in planning his operative procedure.

Blood chemistry changes in low bowel obstruction as a rule are found only in late, neglected cases. This is quite the reverse in high obstruction, where dehydration and hypochloremia appear early. Chemical changes must always be sought and proper tests made in order to correct any pathologic change.

TREATMENT

There has always been, and still is, an urgent need for early diagnosis and prompt surgical intervention. This cannot be over-emphasized. There is usually too much speculation concerning the possibility of an incomplete obstruction correcting itself. Cathartics and morphine are responsible for a great deal of delay and damage.

Preoperative considerations. The majority of patients are unfortunately in poor condition when first seen by a surgeon. There is often considerable dehydration and toxemia. The immediate consideration is, therefore, the administration of proper quantities of water, sodium chloride and glucose. This will not only correct dehydration and blood chemical changes, but will also tend to overcome toxemia and promote elimination. This need not consume any additional time. It can be done while the patient is being prepared for operation.

The operation. The choice of operative procedure will depend on the condition of the patient. In a profoundly sick case in which there is little or no evidence of peristalsis, it is usually unwise to consider a laparotomy. A jejunostomy in such instances is the operation of choice. This can be done in the patient's room under local anesthesia.

In patients who are in fair condtion, laparotomy should be undertaken. It is quite probable that spinal anesthesia, carefully guarded, will be the choice in the future. When the abdomen is first opened, look for a collapsed bowel, and carefully locate the point of obstruction. Do not permit evisceration. It is not necessary, and causes shock. If the bowel is greatly distended, enterostomy should be done, preferably just above the obstruction. Drain the bowel at once if conditions permit. This is especially necessary in advanced cases, as it allows the bowel to regain its peristalsis. If distention and strangulation are so great that peristalsis is absent, an enterostomy will do no good until the bowel is emptied of its contents. By relieving the bowel of its contents, the circulation will return, and the bowel will contract and regain its peristalsis. It is not so much the removal of the toxic contents that benefits the patient as the fact that the distention and strangulation are relieved.

In advanced cases where resection of the bowel is necessary, it is often advisable to do a two-stage operation, the bowel being drained first and later resection and anastomosis done.

Postoperative care consists in supportive measures by the administration, subcutaneously or intravenously, of sufficient quantities of water, sodium chloride and glucose to correct or prevent dehydration, starvation or pathologic blood chemical changes. If there is vomiting or gastric accumulations, these should be relieved by gastric lavage. If the bowel remains distended and does not respond to enemas and pituitrin, a hypertonic salt solution should be given intravenously. In some cases spinal anesthesia, as described by Studdiford[9] and others, has given good results.

CONCLUSIONS

1. In a clinical study of acute mechanical intestinal obstruction, careful consideration should be given to type and location.

2. Strangulation is the most serious complication in low bowel obstruction and occurs in nearly all advanced cases.

3. Toxemia from strangulation and peritonitis is the greatest single factor as a cause of death in low bowel obstruction. The toxemia is probably not due to bacterial toxins in the bowel, since it does not occur without strangulation. The progressive toxemia is no doubt due to strangulation or peritonitis, or a combination of both. The amount of toxemia is in proportion to the extent and rapidity of the strangulation.

4. Enterostomy, especially in advanced cases,

is a great life saving procedure. Its function is not to drain toxins from the bowel, but to relieve distention, thus improving circulation and allowing the bowel to contract and regain its peristalsis.

5. Delay in diagnosis and surgical intervention is responsible for the high mortality in intestinal obstruction. Watchful waiting, morphine and cathartics should be replaced by prompt surgery. In this manner the mortality could be reduced to below ten per cent.

BIBLIOGRAPHY

1. Tuttle, Howard K.: Mortality of intestinal obstruction. Boston Med. and Surg. Jour., 192:791 (April 23), 1925.
2. Holden, W. B.: Intestinal obstruction; survey of 135 personal cases. Arch. Surg., 13:886 (Dec.), 1926.
3. McIver, M. A., and Gamble, J. L.: Body fluid changes due to upper intestinal obstruction. Jour. Am. Med. Assn., 91:1589 (Nov. 24), 1928.
4. Foster, W. C., and Hausler, R. W.: Studies of acute intestinal obstruction; acute strangulation. Arch. Int. Med., 34:697 (Nov.), 1924.
5. Bower, J. O., and Clark, J. H.: Bacillus welchii (perfringens) antitoxin—its therapeutic value; preliminary report based on treatment of 25 cases. Am. Jour. Med. Sci., 176:97 (July), 1928.
6. McIver, M. A., White, J. C., and Lawson, G. M.: Rôle of Bacillus welchii in acute intestinal obstruction with ligation of veins to obstructed loop. Ann. Surg., 89:647 (May), 1929.
7. Wangensteen, O. H., and Chunn, S. S.: Studies in intestinal obstruction; comparison of toxicity of normal and obstructed intestinal content. Arch. Surg., 16:606 (Feb.), 1928.
8. Case, Jas. T.: Roentgenological aid in diagnosis of ileus. Am. Jour. Roentgenol., 19:413 (May), 1928.
9. Studdiford, W. E.: Spinal anesthesia in the treatment of paralytic ileus. Surg., Gyn. & Obst., 47:863 (Dec.), 1928.

THE MILO BAR BELL

Those who study the fantastic advertisements of the "big muscle boys," appearing in such magazines as *Physical Culture,* will remember the pictures of the superman, with the musculature of an ox, holding aloft a particular brand of dumbbells known as the "Milo Bar Bell." From the advertising, one gathers that by the use of this particular device the puniest and weediest of individuals can develop into veritable Samsons. It appears that the Milo Bar Bell Company, which exploits this device, is a trade name used by one D. G. Redmond. The Federal Trade Commission has issued an order to Redmond to cease and desist from "representing by pictures, statements or otherwise, that physical development reasonably attributable to natural growth has been brought about by the use of respondent's bar bell or other appliance or course of instruction." (Jour. A. M. A., May 2, 1931, p. 1527.)

SOLVOCHIN NOT ACCEPTABLE FOR N.N.R.

Solvochin (Spicer & Co., Glendale, Calif., distributor) is a solution of quinine hydrochloride containing small amounts of quinine base together with sufficient phenyldimethylpyrazolon (antipyrine) to render the basic quinine soluble. It is claimed that the solution possesses advantage over the usual quinine preparations in that it may be injected without local irritation. It is recommended in the advertising as the medicament of choice in the treatment of lobar pneumonia, and it is claimed to be essential that the injections of quinine for the treatment of this disease be by the intramuscular route. The Council on Pharmacy and Chemistry declared Solvochin unacceptable for New and Non-official Remedies because it is marketed with unwarranted therapeutic claims. (Jour. A. M. A., May 2, 1931, p. 1477.)

ACUTE ABDOMEN*

Ralph T. Knight, B.A., M.D., F.A.C.S.
Assistant Professor of Surgery, University of Minnesota
Minneapolis

THE term "acute abdomen" is used to signify the sudden onset of a severe pathological condition in the abdomen, or the climax of a more chronic process. It is announced by pain, this being the outstanding complaint of the victim. It is frequently accompanied by nausea and vomiting, and, with more variance, by the other symptoms and signs.

The acute abdomen is a favorite literary subject. However, it is so demanding, so critical, it so taxes one's ability and judgment, its mortality is so high, that we should crystallize our thoughts so that they will work to the best advantage when we are confronted with the emergency.

Most writers list all of the acute intra-abdominal diseases and give in order their symptoms, signs and differentations. It seems to me helpful to think first of the possible pathological processes and their symptoms and signs, and then to attach the diagnosis to the organ which we may determine to be involved.

Hertzler[3] divided all acute abdominal lesions into two classes: (1) perforative; (2) thrombotic or strangulative.

It makes the situation still more clear to divide them into the following classes: (1) obstruction; (2) strangulation or thrombosis; (3) local inflammation; (4) peritonitis. These may exist singly or in combination, or in progression, one after another. According to their severity and the organs involved, they present the symptoms and signs of the acute abdomen in varying degrees.

I. Simple obstruction may come on gradually or suddenly:
   a. Gradually, due to the growth of a mass, narrowing of a stricture, development of adhesions, or gradual change in position of a foreign body.
   b. Suddenly, due to a foreign body or a kink. The more suddenly it occurs, the more sudden and severe are the symptoms.

Pain is the outstanding symptom. Its character is intermittent or colicky. Its location is over the point of obstruction, radiating according to the organ affected.

For the gall bladder and biliary ducts it is under the right costal margin, referred to the right scapular region.

For the kidney and ureter it is in the lumbar or lateral abdominal region referred downward through the iliac region to the bladder, vulva, testis or penis.

For the appendix it is in the right iliac region, or in the epigastrium, gradually becoming localized over the appendix.

For the bowel it is in the region of the obstruction.

A sudden, complete obstruction produces the most severe pain and is usually accompanied by vomiting. Frequently there are mild signs of temporary shock. After the shock the patient tends to double-up, roll about or walk the floor with each recurring spasm of pain. There is some tenderness over the obstruction if it causes distention of the organ obstructed.

As gas, fluid or material collects behind the obstruction, the organ distends and the pain becomes more continuous or the remission less complete.

Distention of the gallbladder, stomach and intestines may be made out by inspection, palpation and percussion.

Early differentiation between intestinal obstruction and ordinary gas colic taxes our skill. A metallic tinkle heard on ausculation during a spasm of pain, as the intestional contents strike the obstruction in a distended loop, is considered by Wangensteen[6] and others to be one of the most helpful signs. It is not always true to form and one must be familiar with intestinal sounds to recognize it. Some time ago, I saw a patient with a strangulated hernia at frequent intervals during the first twenty-four hours while trying to crowd the stubborn patient into the hospital and heard no tinkle. At operation the obstruction was complete and the incarcerated ileum quite dark. The next day another patient, who was vomiting, presented what I thought was a perfect periodic tinkle and increasing distention. An immediate flat film showed no obstructive gas distribution and the symptoms subsided the next day.

---

*Read before the Medical Staff of the Abbott Hospital, Minneapolis, January 6, 1931.

The X-ray method, or so-called scout film, should always be used as soon as obstruction is at all suspected as it gives the most reliable help obtainable. Wangensteen states that roentgenologically demonstrated gas in the small bowel is pathognomic. As time goes on, the bowel becomes more and more distended, quiescent and silent, the patient becomes more and more toxic, the vomiting fecal in character. The diagnosis can then be easily made but the mortality is tremendous.

Concerning the appendix, Lockwood[4] lays stress on the fact that all appendicitis starts as an appendiceal obstruction, or, as he calls it, "acute intestinal obstruction involving the appendix," and should be recognized in that stage and operated at that time in order to lower the present high mortality of appendicitis. We agree that this obstruction should be operated upon early, and not looked upon as a medical condition, "just appendiceal colic," as it has sometimes been in the past. However, appendicitis undoubtedly sometimes starts as a strangulation or thrombosis, not always as a simple obstruction.

A tubal pregnancy becomes an acute obstruction of that organ, which, however, develops gradually until it distends the tube and so causes a constant rather than intermittent pain.

II. Strangulation often causes or accompanies obstruction of a hollow viscus. It may come suddenly with extremely severe pain or the twist may slowly close down on the blood supply. There is more shock than with simple obstruction. The pain is more constant but has severe exacerbations as the viscus tries to free itself. If the structure strangulated has no musculature such as the omentum, the ovary or a pedunculated fibroid, the severe exacerbations do not occur unless a nearby muscular organ becomes stimulated, or involved.

Thrombosis or hemorrhage into such organs as the pancreas, omentum, mesentery, ovary, or a fibroid, causes much the same symptoms as strangulation, by shutting off a section of the blood supply and producing swelling and pressure. When this occurs in the pancreas an especially acute picture is produced. It is either preceded or accompanied by the activation of pancreatic enzymes. This produces violent irritation with early necrosis and early and rapid peritonitis. Strangulation or thrombosis of a non-muscular organ, therefore, produces as sudden and dramatic an onset as an acute obstruction, but the ensuing symptoms and signs are of an acute inflammation.

III. Local inflammation, the third lesion to be discussed, may occur as a primary entity, starting at any point in any organ in the abdomen, or it may be a sequel to obstruction or strangulation. In inflammation, also, pain is the first symptom. The pain of local inflammation usually comes on more gradually than in obstruction. Those who are awakened in the night, or suddenly struck during the day, with acute cholecystitis or appendicitis or pancreatitis have an initial obstruction or thrombosis. With the pain of inflammation, strangulation or thrombosis the patient does not toss about as he does with obstruction, but lies quietly in whatever position puts the least pressure upon the inflamed or thrombosed area. The pain is steady and increasing.

Nausea and vomiting usually follow pain, but do not become feculent as in bowel obstruction.

In addition to pain, the great sign indicating inflammation is tenderness. Tenderness is pain caused by pressure. Manual palpation, skilfully applied, with both superficial and deep pressure, first to areas thought not to be painful and then approaching the suspected area by comparison, is the tried and true method of eliciting tenderness. There are other devices especially suited for confirming tenderness in certain organs, notably the appendix.

1. McBurney's sign is tenderness to pressure over McBurney's point.

2. Meltzer's sign. With the examiner's finger pressed deeply over the site of the appendix, the patient flexes the hip on the body with the knee extended. This renders the psoas rigid and causes more pressure against the appendix between the psoas and the fingers, causing pain.

3. Muscular spasm or resistance on pressure over the appendix.

4. Deep inspiration causes pain in the inflamed gallbladder or appendix by pressure from above and motion.

5. The gravity sign. When turned upon the right side pain is caused in the inflamed gallbladder or appendix because of the pressure of the organs upon them.

6. Murphy's sign. Much like the gravity sign in principle, pressure upon the left side of the abdomen causes pain in the region of an inflamed appendix or gallbladder by transmission of the pressure.

7. Rectal tenderness sign. Finger pressure upward through the rectum to the right causes pain in an inflamed appendix, especially if opposed by abdominal pressure. This is especially valuable in children, as in them the appendix region is in closer proximity.

8. The flexed knee sign. The patient tends to keep the knee and hip flexed with the leg supported to lessen pressure on an inflamed appendix which may be compressed between taut psoas and abdominal muscles.

9. Bastedo's test is especially devised for eliciting tenderness in a subacute or chronic appendicitis, and helps differentiate from a stone in the ureter and salpingitis. The colon is distended with air from a Politzer bag until, as shown by percussion, air distends the cecum. Nausea and pain then indicate tenderness or sensitiveness in the appendix.

10. Rovsing's test is the same, except that the cecum is distended with fluid and gas by progressive retrograde pressure from the sigmoid along the course of the colon, preferably with the patient standing.

11. Blumberg's sign, or rebound tenderness, is pain caused by the sudden release of slowly applied pressure, and indicates peritoneal irritation or early localized peritonitis.

All of these signs were collected and beautifully described in a paper by Cranmer[2] in 1925.

Early pneumonia and pleurisy often cause pain and tenderness in the abdomen in the area supplied from the same spinal segment which supplies the pulmonary area involved. This tenderness, however, is superficial, lessening instead of increasing as the pressure is deepened.

With tenderness there is muscular resistance to palpation in proportion to the degree of inflammatory pressure within. This is an elastic resistance and may be partly overcome by gentle firm palpation and voluntary relaxation by the patient, in contrast to the board-like rigidity of peritonitis.

Next to pain, tenderness and resistance, fever and leukocytosis indicate inflammation. These usually rise much higher in pneumonia, pleurisy, and general enteritis than in any local abdominal inflammation, and local inflammation of a serious degree may exist without them, especially if it is the sequel to obstruction or strangulation rather than a primary severe infection.

Tenderness, then, remains the preëminent and outstanding sign in local inflammation.

Acute enteritis and colitis present inflammation with atypical symptoms. The inflammatory products are not confined but have free drainage through the bowel. The pain, therefore, is not steady, but colicky, as it is in obstruction, because of stimulated peristalsis. Contrary to obstruction, however, the peristalsis is productive of diarrhea, the liquid stools sometimes containing mucus and even blood. When this occurs it must be distinguished from the strangulation of intussusception in which a tender mass can usually be felt by either abdominal or rectal palpation.

With enteritis and colitis there is tenderness and moderate muscular resistance over the entire abdomen. Ausculation gives the sounds of very active peristalsis with rapid movement of fluid and gas but without the striking metallic tinkle heard with obstruction. One should take every opportunity to auscultate normal and abnormal abdomens to become familiar with the sounds.

A difficult pitfall which one must always keep in mind is the fact that not uncommonly an acute cholecystitis, appendicitis or diverticulitis develops on top of a typical general enterocolitis.

IV. Peritonitis is usually secondary to local inflammation or perforation of a viscus. It may be a sequel to one of the other three lesions we have been discussing—obstruction, strangulation or thrombosis, or acute local inflammation—or it may itself usher in the acute picture as the result of the perforation of an ulcer.

Peritonitis passes through three stages: (1) primary contamination; (2) reaction; (3) late peritonitis with paralytic ileus.

The typical first stage caused by perforation of a viscus without much warning is ushered in by acute pain and shock with a rapid weak pulse, low temperature and cold perspiration. Respiration is restricted, the abdomen is scaphoid, and there is extreme tenderness and board-like rigidity. The patient lies absolutely quiet, as movement causes great pain. In pelvic peritonitis, as from a perforated sigmoidal ulcer, the rigidity and tenderness are hidden and must be found by deep pressure over the pelvic brim and by rectal or vaginal examination. It must be remembered that there is an inferior abdominal wall as well as anterior, lateral, and posterior.

If the contaminating substance is emitted from a hollow viscus by gushes with recurring peristaltic waves, the pain is accentuated in savage spasms.

The second stage, or reaction, exhibits less pain, a better general appearance, and a normal temperature and pulse, but there is great pain upon movement, and tenderness and rigidity remain. Free fluid may be found and gas may overlie the liver as found by percussion and X-ray.

The third stage ensues shortly. There is paralytic ileus. Vomiting usually recommences, and is without force. The abdomen is distended and tender with lessened rigidity and without visible or audible peristalsis, the face is worried and anxious, the pulse is rapid and small, the temperature variable, the breathing rapid and labored, the blood pressure falls, and death may soon follow.

When acute peritonitis follows the rupture of an acute local inflammation which was under painful pressure, there is at first a relative decrease of pain on account of the released pressure and the first stage is less dramatic, but there is still some shock if the area is not well walled in. If enough adhesions have been built there is no first stage shock and the tenderness and rigidity are restricted to the area involved but are definitely present. When peritonitis occurs by slow extension of inflammation, the earliest sign is rebound tenderness, pain caused by sudden release of slowly applied pressure.

If the contaminating substance is blood, as from the spleen, liver, mesentery, omentum, or fallopian tube, the irritation of the peritoneum is less severe, there is less pain, tenderness and rigidity, varying in proportion to the amount of blood and the rapidity with which it flows into the peritoneal cavity. Shock varies with the amount of trauma to the viscus and the amount and suddenness of blood emission. There is less recovery in the second stage, as blood loss is the main factor.

Rigidity is the outstanding sign of peritonitis. This term is sometimes used too loosely, to indicate the more elastic and more controllable muscular resistance which signifies local inflammation. The two must not be confused. The rigidity of peritonitis cannot be changed in the least by the patient's greatest voluntary effort or the examiner's most gentle palpation.

In meeting the situation presented by any given patient with an acute condition of the abdomen, I believe it most helpful to first ask oneself, "Do the history, symptoms and signs point to an obstruction of some viscus, large or small; to strangulation or thrombosis; to local inflammation; or to peritonitis?" In differentiating we must remember the stages through which each one passes and the possible sequences from one lesion to another. We are not always called in at the beginning and we must reconstruct, from a carefully obtained history, the development and sequence of the lesion or lesions up to the time of the examination.

When we have decided upon the probable lesion and the viscus affected, the next decision is for or against immediate surgery.

Any obstruction except biliary or ureteral obstruction demands immediate surgical relief. These latter, of course, also indicate surgical interference if not spontaneously relieved, but not as an emergency unless the pain continues unabated for more than a reasonable time.

Strangulation or thrombosis always indicates surgery.

Any acute local inflammation, except acute cholecystitis, acute pyelitis and acute salpingitis, requires immediate operation. Some advocate it for acute cholecystitis, but most surgeons believe that the mortality is increased by operation in the acute stage because of difficulty in preventing peritonitis. The acute inflammation will usually recede under conservative treatment with ice bags and duodenal lavage. If improvement is not evident after a very few hours of this treatment, operation must be undertaken. The gallbladder should then be only drained rather than removed, unless it is actually gangrenous. Removal of the acutely inflamed gallbladder increases the risk of peritonitis and septicemia.

The mortality rate from appendicitis has actually been increasing. Ten to fifteen years ago there was revulsion against the surgical popularity of the appendix. This was probably justified, but the pendulum swung too far and many acute cases are now neglected. Wallace[5] reports 600 cases of acute appendicitis, 398 simple ones with .5 per cent mortality, 202 with perforation and 5.5 per cent mortality. Others report a mortality in cases with perforation as high as 14 per cent. Bower and Clark[1] state that 73 per cent of fatal appendicitis cases have received laxatives and that 67 per cent of the deaths are because of the laxatives. They review 1,000 operations for appendicitis, 45 per cent of them with perforation, by fifty-five different surgeons in one year in each of two Philadelphia hospitals (1926 and 1929 respectively), with an overall mortality of 8 and 10 per cent, respectively. If, in the presence of abdominal pain, the appendix can be shown to be tender by any of the methods listed above, immediate operation should be insisted upon.

The fact that ordinary indigestion with gas colic and even enteritis and colitis is often helped by a cathartic has given the laity the habit of taking a cathartic for every abdominal pain. This is disastrous for every surgical condition, and other treatment is also better for gas colic and enterocolitis while the pain lasts. The public should be taught never to take a cathartic in the presence of abdominal pain, but if the pain is not soon relieved by heat and a small enema a physician should be called.

Peritonitis, if of the rare pneumoccous type, has a lower mortality if not operated upon. All other peritonitis I believe is immediately surgical, with conservative surgery indicated, and careful drainage should be instituted along the parietal peritoneum and not between the intestinal loops.

SUMMARY

1. Pain is the chief symptom of the acute abdomen.
2. Sudden onset of pain indicates obstruction of a viscus, strangulation or thrombosis, sudden perforative peritonitis, or gas colic.
3. Intermittent colicky pain indicates obstruction of a viscus, strangulation, intermittent gushes from a perforation, gas colic, or enterocolitis.
4. Steady increasing pain indicates thrombosis, distention, inflammation or peritonitis.
5. Tenderness and muscular resistance indicate inflammation or distention of a viscus.
6. Rigidity indicates peritonitis.
7. Loud peristaltic noises indicate obstruction of the bowel or enterocolitis.
8. The striking tinkle indicates obstruction.
9. Diarrhea indicates intussusception or enterocolitis.
10. Distention of the abdomen indicates paralytic ileus, late obstruction of bowel or late peritonitis.
11. Vomiting had better be disregarded as it may be present in any condition and does not differentiate except when fecal, and then it is too late.
12. Gas colic and enterocolitis are the only two medical conditions to be distinguished from the acute surgical ones. Gas colic can be distinguished from bowel obstruction by the absence of small bowel gas on the scout film. Enterocolitis can be distinguished by diarrhea.
13. Only surgical lesions of the gallbladder, ureters and salpingitis can be temporized with, and only under careful observation.
14. A cathartic is absolutely contraindicated in the presence of abdominal pain.

BIBLIOGRAPHY

1. Bower, J. O., and Clark, J. H.: A plan for the reduction of the mortality in acute appendicitis. Penn. Med. Jour. (March), 1930.
2. Cranmer, Richard: Differential diagnosis in upper abdominal disease. Journal-Lancet (Feb. 15), 1926.
3. Hertzler, A. E.: Acute abdominal disasters. Am. Jour. Surg. (Oct.), 1927.
4. Lockwood, A. L.: Acute intestinal obstruction involving the appendix. Can. Med. Assn. Jour., 23:400, 1930.
5. Wallace, H. K.: Acute appendicitis—A study of six hundred consecutive cases. Trans. West. Surg. Assn. (Dec. 19), 1925.
6. Wangensteen, O. H., and Goehl, R. O.: Evaluation of the expulsion of enemas as a criterion of intestinal obstruction. Arch. Int. Med. (Oct.), 1930.

EXTRA-OCULAR MUSCLE PARALYSIS FOLLOWING SPINAL ANESTHESIA*

K. R. Fawcett, M.D.
Duluth, Minnesota

SPINAL anesthesia for both major and minor surgical procedures below the clavicles has been in use since the beginning of this century, but it has remained for the development of less toxic derivatives of cocain and the introduction of ephedrin to combat the fall in blood pressure to make this type of anesthesia preferable in most instances to the older types of inhalation anesthesia, and thus to popularize it. Complications are rare. A varying degree of circulatory collapse is the earliest one to appear, and probably the most common. The percentage of lung complications, nausea, vomiting and gas pains is definitely lower than is found with inhalation anesthesia. Occasionally postoperative headache is noted similar to the well known spinal puncture headache.

Spinal anesthesia has, however, brought with it one complication that is of especial interest to the ophthalmologist, namely, extra-ocular muscle paralysis. In reviewing the literature, it appears that postoperative palsies are limited almost without exception to the eye muscles. Levine,[1] who has recently published a most excellent monograph on this subject, refers to Blatt,[2] who reviewed the histories of eighty-eight cases and found the trochlear nerve involved in four instances and the oculomotor in six. The remaining seventy-eight involved the abducens, and eighteen of the seventy-eight were bilateral. The interval between the anesthesia and onset of symptoms varied from three days to three weeks. In a large majority of the cases the paralysis disappeared in one to three weeks; in a few it lasted from four to nine months, and in one persisted sixteen months.

From the service of Dr. Babcock, Reber,[3] in 1910, reported five cases of abducens paralysis in a series of 2,000 spinal anesthesias.

No satisfactory reason has been established for the singling out of the extra-ocular muscles as candidates for this peculiar post-anesthetic paresis, nor for the special vulnerability of the external rectus as compared to the other muscles. It is to be noted that the paralysis is often accompanied by other symptoms—photophobia, headache and dizziness appearing rather commonly in case reports, while backache, vomiting, hallucinations, neuroses and tetanic contractures have been occasionally observed. Babcock[4] feels that the cause is a mild infection from the injection of contaminated solutions. He observed that the five cases reported from his service by Reber in 1910 followed the use of imported ampules of tropococaine and stovaine, and states that since discontinuing the use of these ampules he has had no cases of ocular paralysis in the past eighteen years. Evans[5] also feels that the agent is a fault in administration technic, with a resulting meningismus or low grade meningitis. Blanluet and Caron[6] suggest an elective toxic action of the drug, a localized hemorrhage, or a mild meningeal infection. Ricci[7] reported a case with a past history which made him feel the intraspinal injection had stirred up an old chronic serous meningitis. Blatt believes that a neurotic or functional background is a predisposing factor.

There can be little question but that the injected drug often diffuses in appreciable concentration as high as the base of the brain. North and Ferguson, in some experimental work on dogs which has not as yet been published, have shown by the use of dyes that the spinal anesthetic agent frequently reaches the medulla. Thyroid and mastoid operations, even tonsillectomies, have been successfully performed under spinal anesthesia. Anesthesia levels including the chin and lower lip have been reported.

The fact that the paralysis occurs more often with stovaine than with novocaine appears significant. Sollmann[8] states that stovaine is definitely more toxic and very slowly broken down and excreted as compared to novocaine. To me this emphasizes the elective toxic action as the causative agent. As to the peculiar affinity for the sixth nerve, it is to be remembered that the abducens nerve occupies a very superficial position in relation to the fourth ventricle which communicates directly, through the foramina of Luschka and Magendie, with the subarachnoid space into which the anesthetic is injected.

---

*From the Duluth Clinic. Presented before the St. Louis County Medical Society, December 11, 1930.

Koster and Weintrob[9] call to attention the animal experiments of Van Lier,[10] who demonstrated swelling of the nucleus of the ganglion cells after spinal anesthesia, and suggest a possible degeneration of the ganglion cells as a cause of abducens paralysis.

If the paralysis is due to a mild meningitis, it would appear that strabismus should be a much earlier and more common symptom of specific meningitis. It has also been my observation that strabismus, when it is seen in a specific meningitis, is usually divergent, while the usual type following spinal anesthesia is convergent.

I wish to present two cases of unilateral abducens paralysis following spinal anesthesia. The first is very characteristic of the short course and rapid, unaided recovery which usually occur in this condition. The second has proved very disturbing—both to the patient and to us.

Case 1.—Mrs. E. W., white, aged 46, was given spinal anesthesia for a diagnostic curettage on September 18, 1930. One hundred mgm. of novocain were injected, and ephedrin was given simultaneously to maintain satisfactory circulatory tone. The operation and postoperative recovery were uneventful, and the patient was discharged from the hospital on the fourth day. On the thirteenth day after operation, the patient suddenly developed diplopia, accompanied by slight photophobia, vertigo, and headache. Examination showed a paralysis of the right external rectus muscle. Eye movements otherwise were normal, and the vision of each eye was 20/20. There was no past history of strabismus. The patient was given a good prognosis without being too specific as to intervening time. Therapy consisted simply of covering one eye alternately for half day periods to relieve the diplopia. On the thirteenth day the paralysis had entirely disappeared, and ocular rotation was complete. The patient has had no further trouble.

Case 2.—Mrs. L. T., white, aged 42, was operated upon for fibroids on May 20, 1929. A hysterectomy and appendectomy were performed. One hundred and fifty mgm. of novocaine were injected intraspinally, and ephedrin given hypodermically as in the preceding case. The operation was uneventful. Convalescence was a little slow. On the twelfth day postoperatively the patient developed diplopia, and examination showed complete paralysis of the left external rectus muscle. Shortly after this, the patient left the city, and we were unable to study and observe her further. However, the diplopia continued. A recent examination at her home showed a persisting strabismus. However, she states that the diplopia is no longer constant, and with the right eye covered she is able to rotate the left eye laterally about twenty degrees. The paralysis has now persisted for seventeen months. The patient is naturally rather discouraged and informed me that a doctor she had consulted while out of town had advised a muscle shortening operation. However, I feel that there has been some improvement, and believe that the patient should wait another six months at least before considering operation.

CONCLUSIONS

1. Extra-ocular muscle paralysis is a rare complication of spinal anesthesia, but must nevertheless be kept in mind constantly by the surgeon and ophthalmologist.
2. The etiology has not yet been definitely established.
3. The onset of symptoms varies from three days to three weeks.
4. In a large majority of the cases the symptoms clear up spontaneously within three weeks.
5. The treatment should be extremely conservative, and muscle operation certainly should not be resorted to under eighteen months.

REFERENCES

1. Levine, J.: Paralysis of an extra-ocular muscle after spinal anesthesia. Arch. Ophth., 4:516, 1930.
2. Blatt, N.: Ocular paralysis after spinal anesthesia. Wien. med. Wchnschr., 79:1391, 1929.
3. Reber: quoted by Babcock.
4. Babcock, W.: Spinal anesthesia. Am. Jour. Surg., December, 1928.
5. Evans, C.: Possible complications with spinal anesthesia. Am. Jour. Surg., December, 1928.
6. Blanluet and Caron: Abducens paralysis after stovain anesthesia by lumbar puncture. Ann. d'ocul., 138:67, 1907.
7. Ricci, E.: Ophthalmic Year Book, 1927 (abstract).
8. Sollmann, T.: Manual of Pharmacology, 1924.
9. Koster and Weintrob: Anesthesia fatalities, Am. Jour. Surg., August, 1930.
10. Van Lier: quoted by Koster and Weintrob.

ALLERGY, ANAPHYLAXIS AND HYPERSENSITIVENESS*

Albert V. Stoesser, M.D., Ph.D.
Minneapolis

ALLERGY, which means altered reactivity, is a term introduced by Von Pirquet and Schick[20] at the time they were studying serum sickness, a condition which exists in many individuals after receiving therapeutic serums. Doerr[7] later used the term to apply to all phenomena of hypersusceptibility in animals and in man, and Zinsser[23] also was in favor of using the word allergy to designate this interesting field of medicine. We find, however, under the general heading, allergy, the existence of a great deal of confusion when any attempt is made to classify and correlate the various experiments with animals by numerous workers and the clinical observations of many physicians.

The terms anaphylaxis, allergy and hypersensitiveness are used interchangeably in the medical literature. An effort has therefore been made at this time after a careful survey of the reports of some of the leading observers in this field to present a classification or outline with the hope that it will be of some value in the diagnosis and possibly in the prognosis and the treatment of allergic conditions.

CLASSIFICATION OF ALLERGY

I Anaphylaxis or anaphylactic hypersensitiveness
  A. In animals—experimental
  B. In man—anaphylactic shock in a previously sensitized individual
  C. Drug anaphylaxis in man
II Human or natural hypersensitiveness
  A. Serum allergy (or sickness)
  B. Drug allergy (or idiosyncrasy)
  C. Atopy or atopic hypersensitiveness
    1. Eczema
    2. Allergic coryza due to
      a. Inhalants
        (1) Animal emanations
        (2) Pollens (hayfever or pollinosis)
        (3) Powders and perfumes.
      b. Foods and drugs
      c. Bacterial products of infection
    3. Bronchial asthma due to
      a. Inhalants
      b. Foods and drugs
      c. Bacterial products
    4. Other conditions which are still questionable
      a. Urticaria, and some forms of dermatitis and pruritus
      b. Food allergy
      c. Allergic migraine
      d. Purpura (Henoch's)
      e. Some cases of epilepsy
  D. Serum and drug shock in the atopic individual
III Hypersensitiveness in infection
  A. Bacterial allergy or hyperergia. Certain manifestations in the following diseases:
    1. Tuberculosis
    2. Rheumatic fever
    3. Scarlet fever
    4. Nephritis
    5. Lobar pneumonia
  B. Fungous and parasitic infections may be accompanied by allergic reactions

The first large division under allergy is anaphylaxis or anaphylactic hypersensitiveness. This subject has been carefully reviewed and defined by Wells.[21] He states that much confusion exists in the literature because of the loose use of the term anaphylaxis to cover a multitude of conditions. In order to have anaphylaxis we must have the animal sensitized by a substance called an antigen which is a soluble protein foreign to the circulating blood of the animal and capable of producing immune bodies in the blood of the animal when injected. These immune bodies are called antibodies and they reach their peak of production about 7 to 10 days, or more, after the injection of the antigen. Then when the antigen is reinjected there is a specific union of the antigen with the antibodies in the tissues, giving rise to an anaphylactic reaction or shock.

---

*From the Allergy Clinic, Department of Pediatrics, University of Minnesota.

In true anaphylaxis, the non-striated muscle, especially the uterine muscle, from a sensitized animal will if removed from the body and placed under suitable conditions be found to give strong contractions when brought in contact with even very dilute solutions of the specific antigen. Furthermore, the state of sensitivity can be passively transferred in many cases to another animal. Then, too, in anaphylaxis the observation has been made that there is a loss of sensitivity after anaphylactic shock if the animal survives. This is the refractory period during which there exists a condition of specific desensitization.

Up to the present time, there is no conclusive evidence that would indicate that heredity plays any part in anaphylaxis. Monkeys and man are hard to sensitize when a comparison is made with such animals as the guinea pig, rabbit and dog. This means that only a small proportion of the population are sensitized when receiving a foreign serum such as tetanus or diphtheria antitoxin.

Occasionally an individual lends himself to an easy sensitization, and then upon receiving the second injection in the form of some therapeutic serum he goes into true anaphylactic shock, especially if the injection is made intravenously. Like an animal, he becomes desensitized after this reaction, although sensitivity may gradually return.

Desensitizing the anaphylactic sensitive individual before the administration of serum is rather difficult. Larson[12] states that it can be accomplished if a small amount of the preparation (antitoxin) is injected intravenously every twenty minutes, or intraperitoneally every four hours, or subcutaneously every twenty-four hours. Injecting a small amount of the material subcutaneously and waiting only one-half hour is not safe.

Drug anaphylaxis in man includes both the local and systemic reactions to various drugs. Wolff-Eisner[22] thought that these reactions might be produced by the blood or tissue proteins altered by the chemical which the individual received. These altered protein compounds act the same as foreign proteins and are capable of sensitizing man or animal in some cases.

Before leaving anaphylaxis it may be of interest to note that it is easier to produce anaphylactic shock if the hydrogen ion concentration of the blood is shifted to the acid side of the normal range and kept there. A shift to the alkaline side makes it more difficult to have an anaphylactic reaction.

Next, the second division of allergy (see classification) may be considered. Human or natural hypersensitiveness is of special interest to the clinician and first consideration will be given to serum allergy. This condition was carefully studied by Von Pirquet and Schick and is quite common. About five to fifteen days after the administration of a serum there appears an urticarial eruption or rash with or without fever, joint pains and general prostration. The reaction is thought to be caused by an interaction between the antigen and the antibodies which have been produced. In this way there is a close connection with anaphylaxis and some observers have called it a delayed anaphylactic reaction, but others have stated that there is no conclusive evidence of the antigen-antibody union and the condition is not anaphylactic.

In regard to drug allergy, some chemicals are capable of producing symptoms similar to those found in serum allergy. For example the chemical compound, phenyl-ethylhydantoin (commonly called nirvanol) is used in the treatment of chorea, and in many individuals it gives rise to a typical series of symptoms. After about 7 days of administration, there is a sudden onset of fever and about two days later an eruption appears. The patient is quite uncomfortable. Blood examination may reveal an increased number of eosinophiles.

Human hypersensitiveness also includes that group of allergic diseases to which Coca[5] gave the name atopy, which means "a strange disease." From this, the term atopic hypersensitiveness has been derived. Coca included all those clinical forms of hypersensitiveness which occur so far as is known only in human beings and which are subject almost entirely to inheritance.

The clinical forms included in this category are hayfever and asthma, and possibly eczema. More information may lead to the addition of such conditions as urticaria, and some forms of dermatitis and pruritus, food allergy, allergic migraine, purpura (Henoch's) and some cases of epilepsy.

The substances to which the atopic individual responds in an abnormal way are called atopens, and they may be proteins or non-proteins. They react with specific bodies found in the blood of nearly all atopic persons. Whether these bodies which have been called atopic reagins are true antibodies developed immunologically under antigen stimulation or physiological products like the natural hemo-agglutinins and hemolysins is not known.

In atopic hypersensitiveness, heredity seems to play an outstanding part. Coca states that by the tenth year of life atopic symptoms have appeared in 72 per cent of the atopic offsprings under a bilateral hereditary influence, in 35 per cent of those subject to a unilateral influence, and in only 20 per cent of those with a negative family history. Bray[3] says that asthma and related conditions are transmitted as a Mendelian dominant. The greater the heredity the earlier are symptoms manifested and the earlier in life the individual becomes sensitive the greater the tendency to multiple sensitization.

The atopic individual may respond with a marked reaction when receiving a therapeutic serum, especially if it is given intravenously. The same thing may occur if certain drugs such as the arsenicals are given to these people. This phenomenon may be referred to as serum and drug shock in the atopic individual (see classification). According to Lamson[11] this is not due to anaphylaxis although clinically the shock can hardly be differentiated from a true anaphylactic reaction in a previously sensitized person.

Desensitization of the atopic sensitive individual with the subsequent injection of the foreign substance is, as in anaphylaxis, not such an easy procedure. The most concentrated serum obtainable should be used and first injection should be made subcutaneously. According to MacKenzie and Hanger[14] it should not be more than 0.01 c.c. If no symptoms develop, the dose may be doubled every thirty minutes until 1 c.c. is given. Then the next injection may be 0.1 c.c. intravenously, and every twenty minutes thereafter the intravenous dose may be doubled until the required amount of serum has been given.

It may be interesting to note at this time that in the atopic individual any drug or diet which tends to shift the hydrogen ion concentration of the blood to the acid side within the normal range decreases in some cases the tendency to allergic reactions. This is just opposite of the conditions which have been observed in case of anaphylaxis.

There has, however, been an effort made to consider anaphylaxis in the animal and hypersensitiveness in man as due to the same fundamental cause, with man responding not exactly in the same way as the animal because he is a more highly differentiated subject in which the allergic mechanism plays its part.

Topley and Wilson[19] state that the differences between anaphylaxis and human hypersensitiveness are only the result of an incomplete study and quote Doerr as pointing out the fact that we have studied natural hypersensitiveness only in man and anaphylaxis only in the experimental animals, so that it is at least possible that the differences which have been noted are referable in a large part to the restricted universe selected for study.

Ratner and Gruehl[16] have since reported experiments in which they have been able to show that the blood of a human asthmatic and the blood of an asthmatic guinea pig can passively sensitize the normal human skin and normal guinea pigs. From this they believe that their results indicate that hypersensitiveness in man and anaphylaxis in lower animals are fundamentally dependent on a common anaphylactic antibody and that the distinction between anaphylactic antibody and the atopic reagin is untenable.

Finally the third division (see classification) may be briefly discussed. Hypersensitiveness to infection represents another interesting field for further investigation. In the first place, bacterial allergy or hyperergia indicates an increased capacity of the tissues to react to the bacterial products of living organisms localized in some part of the body, or to react to the disintegration products of the dead organisms or of the infected tissues in the focus. The allergic state may in certain instances be regarded as an index of resistance, a thing which some believe to be true in the case of tuberculosis. Krause[10] and Pottenger[15] have considered allergy as representing part of the protective mechanism of the tuberculous infected individual.

Recently, however, Rich[17] states that in spite of the fact that bacterial allergy operates to destroy the invading organisms and plays an accessory rôle in certain infections, the present state of information in regard to tuberculosis does not warrant the use of the term allergy to indicate resistance in tuberculosis. Branch and Cuff,[2] after studying carefully the allergic, anaphylactic and immune reactions in guinea pigs following inoculation with heat-killed tubercle bacilli, conclude that allergy and anaphylaxis in tuberculosis are independent phenomena, and immunity may be present without allergy. Furthermore they believe that the development of allergy appears to be interrelated with the process of caseation.

Some observers believe that an allergic reaction takes place in acute rheumatic fever. The streptococcus present in a focus in the human body sensitizes certain tissues, and the joint manifestations of rheumatic fever represent a maximal response of the hypersensitized tissue to a minimal stimulus. Swift and Derick,[18] Birkhaug,[1] Clawson,[4] and others have studied the possibilities of the application of the theory of allergy to the bacteriological problems of rheumatism.

Cooke[6] believes that certain of the manifestations present in scarlet fever may be explained on an allergic basis. Longcope[13] and his colleagues[8] have found positive skin tests to the streptococcus in some individuals suffering with acute glomerular nephritis. This might indicate that the kidney manifestations were an allergic response on the part of kidney tissue highly sensitized to the streptococcus which might be localized in a distant focus, such as the tonsil. Then, too, lobar pneumonia caused by types one and two pneumococcus has been considered in part as an allergic phenomenon.

Certain fungous and parasitic infections are accompanied by allergic reactions. For example, it has been shown that with an extensive thrush infection of the gastro-intestinal tract there may be a skin eruption resembling a severe weeping eczema. This condition has been considered by many as an allergic phenomenon and this same opinion is held by Henrici.[9]

With this classification of allergy the author has made no attempt to discuss in detail the various divisions and subdivisions but only has offered a few remarks in explanation. The field of allergy with all its phases is certainly of great interest, and it is hoped that further work in this field will lead to a simpler classification. At the present time a review of the writings of investigators does not permit this.

REFERENCES

1. Birkhaug: Jour. Inf. Dis., 40:549, 1927; 43:280, 1928; 44:363, 1929.
2. Branch and Cuff: Jour. Inf. Dis., 47:151, 1930.
3. Bray: Brit. Med. Jour., 384 (March 1), 1930.
4. Clawson: Arch. of Path., 9:1141 (June), 1930.
5. Coca: "Atopy" in the Newer Knowledge of Bacteriology and Immunology. Univ. of Chicago Press, 1004, 1929.
6. Cooke: Jour. of Allergy, 1:22 (Nov.), 1929.
7. Doerr: Ergebn. Hyg. Bakt. Immun. Therap., 5:71, 1922; "Die Idiosynkrasien" in Mohr and Staehelin's Handbuch der inneren Medizin, 2nd Edition, 448, 1926.
8. Hansen-Pruss, Longcope, O'Brien: Jour. Clin. Investigation, 7:543 (Oct.), 1929.
9. Henrici, A. T.: A Personal Communication.
10. Krause: Am. Rev. Tuberc., 14:211, 243, 271 and 316, 1926.
11. Lamson: Jour. Am. Med. Assn., 93:1775 (Dec. 7), 1929.
12. Larson, W.: A Personal Communication.
13. Longcope: Bull. Johns Hopkins Hosp., 45:335 (Dec.), 1929.
14. MacKenzie and Hanger: Jour. Am. Med. Assn., 94:260 (Jan. 25), 1930.
15. Pottenger, F. M.: Tubercle, 10:409 (July), 1929.
16. Ratner and Gruehl: Proc. Soc. Exp. Biol. Med., 27:574 (March, 1930.
17. Rich: Arch. Int. Med., 43:691 (May), 1929.
18. Swift and Derick: Proc. Soc. Exp. Biol. Med., 25:224, 1927; Jour. Exper. Med., 49:615 and 993, 1929.
19. Topley and Wilson: The principles of bacteriology and immunity. Wm. Wood & Co., 2:703, 1929.
20. Von Pirquet and Schick: Die Serum Krankheit. Monograph, Leipzig and Wien, 1905.
21. Wells: The chemical aspects of immunity. Chemical Catalog Co., 2nd Edition, 225, 1929.
22. Wolff-Eisner: Quoted by Wells.
23. Zinsser: A textbook of bacteriology. Appleton & Co., 6th Edition, 292, 1927.

CASE REPORTS

SUBCUTANEOUS EMPHYSEMA FOLLOWING ASPIRATION OF FOREIGN BODY

REPORT OF THREE CASES*

Porter P. Vinson, M.D.
and
Herman J. Moersch, M.D.
Rochester, Minnesota

Forbes, in 1926, described the preoperative occurrence of emphysema of the neck and thorax of a child, aged two years and nine months, three days after aspiration of a portion of nut. Except for this report, we have not been able to find any reference to a similar complication. In a comprehensive article on the symptoms and signs of foreign bodies in the bronchi, McCrae stated that the escape of air from the lung into the mediastinum is not uncommon following aspiration but he did not mention the possibility of the development of subcutaneous emphysema. Because of the apparent rarity of this complication, the following cases are presented.

Case 1.—A boy, aged six years, aspirated a small metal paper clip, January 19, 1930. Five hours after aspiration, there was dyspnea and substernal pain with elevation of temperature to 101.8° F. Roentgenograms of the thorax revealed the foreign body in the right bronchus with partial atelectasis of the right lung.

The child was brought to The Mayo Clinic for examination twenty-one hours after the foreign body had been aspirated and in addition to the roentgen-ray evidence of the foreign body in the lung with partial obstruction in the bronchus, there was a moderate amount of subcutaneous emphysema over the anterior portion of the thorax and neck on the right side (Fig. 1). Bronchoscopic examination revealed the foreign body in the right bronchus and it was removed without difficulty (Fig. 2). The following day, the emphysema had disappeared, and the temperature had returned to normal. The child was dismissed from observation January 23. A letter received from the parents a year later stated that the child was perfectly well.

Case 2.—A boy, aged three years, had been well until the evening of December 24, 1930, when he choked while eating peanuts, but because he was held upside down at the time of the accident and several pieces of nut came out of his mouth it was assumed that none was aspirated. Following this, he was rather listless and had a little cough and fever until the evening of January 4, 1931, when marked swelling of the head and neck occurred after a severe coughing spell. These paroxysms of coughing recurred with increasing swelling of the head and neck and a physician was consulted. Evidence of obstruction in the right main bronchus with marked subcutaneous emphysema was found. Roentgenograms of the thorax revealed an emphysematous condition of the upper portion of the right lung with atelectasis of the lower portion, air in the pericardial cavity, and pronounced emphysema of the tissues of the head, neck, upper portion of the thorax and arms (Fig. 3).

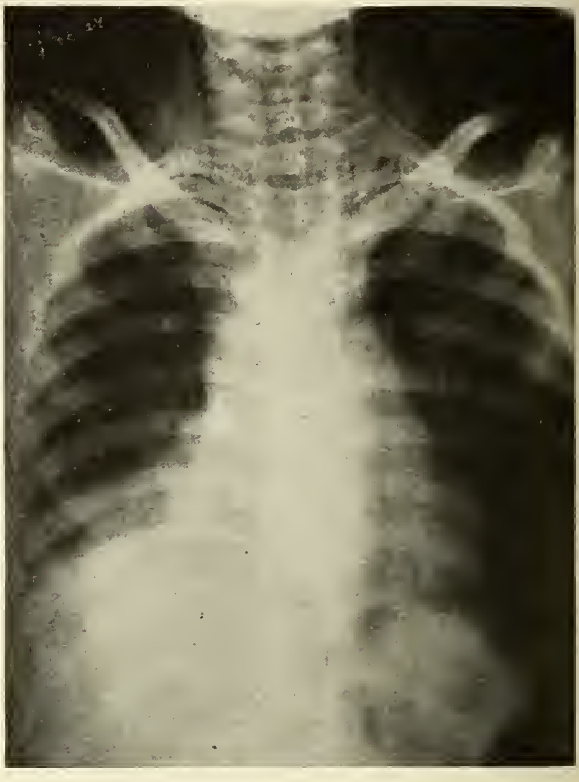


Fig. 1 (Case 1). A paper clip in the right bronchus. Emphysema in the tissues of the neck may be noted.

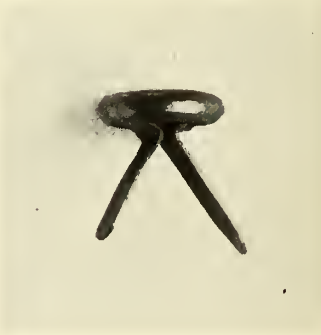


Fig. 2 (Case 1). Paper clip removed at bronchoscopy.

---

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Submitted for publication February 18, 1931.

The child reached the clinic for treatment late in the afternoon of January 5, 1931, in a critical condition. A bronchoscopic examination was made immediately and a peanut kernel was found in the right main bronchus. The foreign body was grasped with forceps and, as it was too large to be removed through the bronchoscope, it was brought up to the end of the tube and was withdrawn with the tube and forceps. Examination of the foreign body, after removal, disclosed that it consisted of a portion of a kernel only, but as air now entered both lungs normally, it was considered inadvisable to reintroduce the bronchoscope because of the danger of producing laryngeal edema. The child was admitted to an oxygen chamber immediately after bronchoscopy, and the following morning the remainder of the nut was expelled spontaneously. Recovery was uneventful and the patient was dismissed January 9. At the time of dismissal, there was scarcely any air in the subcutaneous tissues, there had been marked restoration of the lungs to normal and the amount of air in the pericardial cavity had greatly diminished (Figs. 4 and 5). In every other respect, the child seemed well. A letter from the parents two weeks later stated that he was in good health.

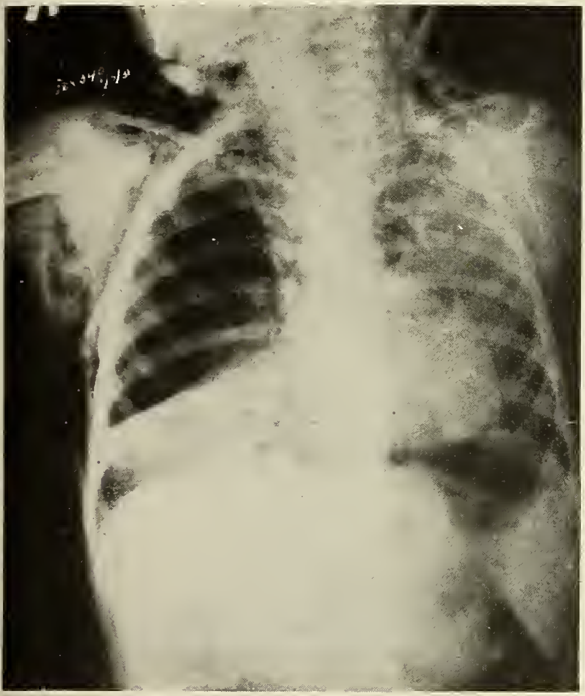


Fig. 3 (Case 2). A peanut in the right main bronchus, with emphysema of the upper part of the right lung and atelectasis in the lower part, marked subcutaneous emphysema of the tissues of the neck and thorax and apparent pneumocardium.

Case 3.—A girl, aged two and a half years, aspirated a peanut kernel January 19, 1931. She seemed comfortable for two days, when fever and cough developed and it was thought that she had penumonia. January 24, swelling of the upper part of the thorax and neck developed that gradually increased with each spell of coughing. The patient was brought to the clinic soon after the development of the swelling. Almost complete obstruction to the passage of air into the right lung, and marked subcutaneous emphysema of the tis-

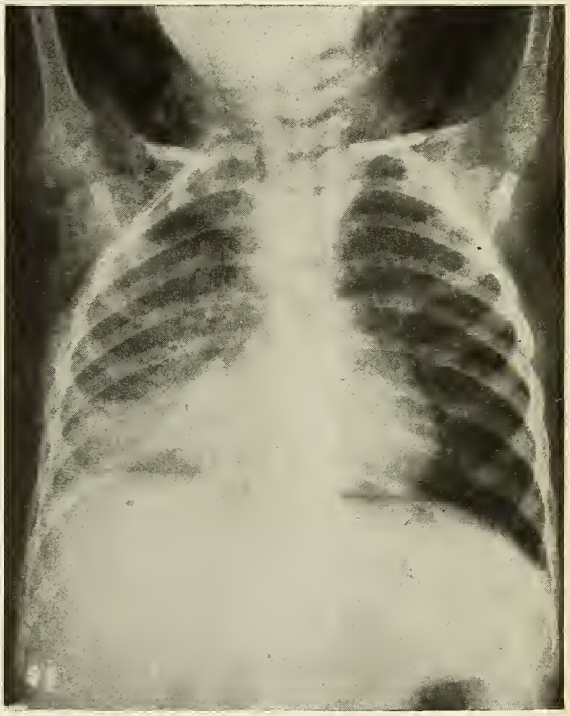


Fig. 4 (Case 2). The thorax after removal of the foreign body. The emphysema of the upper portion of the right lung is no longer apparent; the infiltration of the lower portion of the lung is greatly reduced, and there is much less air than before bronchoscopy.

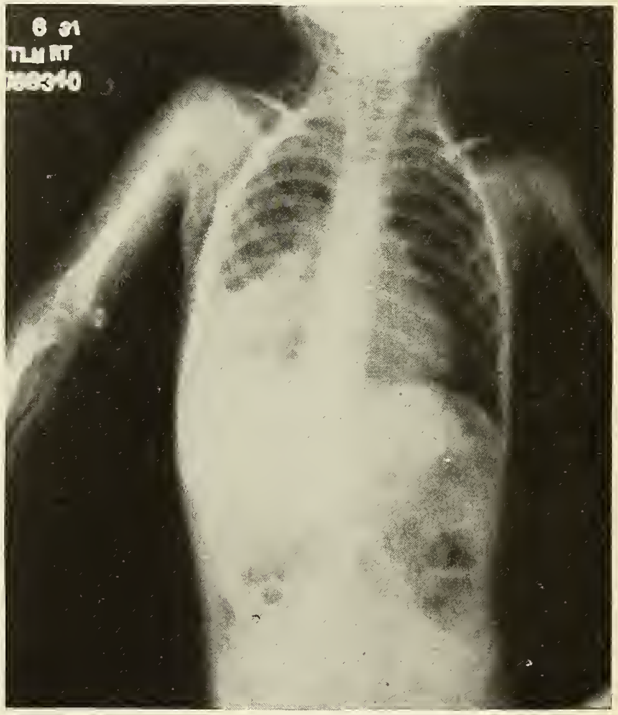


Fig. 5 (Case 2). Air is shown extending into the tissues of the forearm.

sues of the head, neck and upper portion of the thorax were found.

It was considered unwise to delay removal of the foreign body and roentgenograms of the thorax were not made. Bronchoscopic examination disclosed a large portion of peanut kernel in the right main bronchus and it was removed. The child was placed in an oxygen chamber immediately after the removal of the foreign body, but in spite of this it was necessary to open the trachea after twenty-four hours. There was practically no reaction associated with the tracheotomy and after five days the tube was removed. The patient was dismissed February 2. The emphysema had disappeared completely, and the child seemed perfectly well.

COMMENT

In the first case, it was assumed that the sharp point of the paper clip had been forced through the wall of the bronchus during a paroxysm of coughing and that this had permitted the escape of air into the mediastinum with the subsequent development of subcutaneous extravasation.

In the second and third cases, the foreign body evidently was of just the proper size to permit the passage of air into the distal bronchi on inspiration, but to have closed the bronchus on expiration. This resulted in obstructive emphysema and air was forced from a ruptured emphysematous bleb on the surface of the lung into the mediastinal structures and then into the subcutaneous tissues. In the second case, it is very difficult to explain the apparent presence of air in the pericardial cavity.

BIBLIOGRAPHY

1. Forbes, H. H.: Report of a case of emphysema of the neck and chest (preoperative) following inhalations of a piece of a nut. Laryngoscope, 36:192 (March), 1926.
2. McCrae, T.: Foreign bodies in the bronchi. Lancet, 1: 735-741 (April 12); 787-793 (April 19); 838-841 (April 26), 1924.

OMENTAL CYST IN A CHILD*

Oswald S. Wyatt, M.D., F.A.C.S.
Minneapolis

The following case I wish to report, with a brief discussion, because the condition is rather uncommon, and the diagnosis is unusually difficult. This omental cyst, which we did not diagnose, presented the unusual feature of rupturing, which made the picture still more obscure.

Ladd in the American Journal of Diseases of Children for 1926 briefly surveyed the literature and up to that date only about forty-five cases had been reported.

The condition is usually diagnosed as tuberculous peritonitis of the ascitic type, ascites, hydatid cyst, ovarian cyst, cystic kidney, mesenteric cyst or enteric cyst. When the cyst has ruptured, as in this case, the most likely diagnosis is primary peritonitis or perforated appendix with peritonitis. At least the picture is one of an acute surgical abdomen.

By way of differentiation, patients with large cysts usually present dullness over the entire front of the abdomen. A bismuth meal in the intestinal tract might show the fluid to be accumulated in front of the intestines. If paracentesis reveals a chylous fluid containing broken down red blood cells, it should suggest a lymphatic cyst, which might be of omental or mesenteric origin.

A cystoscopic examination should rule out a cystic kidney.

Bimanual examination, with one finger in the rectum, should rule out small ovarian cysts, especially in young children.

Negative tuberculin tests should rule out tuberculosis.

If the cyst is very mobile it should bring to mind the possibility of an omental cyst.

The treatment of this condition is surgical, the results should be good, and the risk slight.

Halsted reported, in the Johns Hopkins Hospital Bulletin of 1920, a case of omental cyst. The patient was a female child, two years of age, who had been tapped for ascites. The point which he wished to stress was that whenever a child comes under observation with abdominal distension, the possibility of lymphatic cyst should be borne in mind. He saw his patient again at the age of twenty-four, married and in good health.

CASE REPORT

The patient, a female child, three and a half years of age, when last seen by Dr. E. F. Robb, about one year ago, was a healthy, well developed, well nourished, normal child. On January 8, 1931, about 3 p. m., the child began to compain of abdominal pain, which the mother did not think was very severe. About three hours later the child vomited, the only time she did vomit during the illness. She ate supper that evening. Later the mother gave her an enema with constipated results. The child continued to complain of abdominal pain until about midnight, then fell asleep and slept very well for four to five hours. On the morning of the 9th, the child still complained of abdominal pain and refused breakfast and lunch. About 2 p. m. the pain became very severe. Two hours later the temperature was 104 degrees and her abdomen presented a board-like rigidity.

Tenative diagnosis: Perforated appendicitis with generalized peritonitis.

Operation: Upon opening the abdominal cavity a large amount of light green fluid (estimated at about 1,000 c.c.) was encountered in the peritoneal cavity. The peritoneum was moderately inflamed and I thought at first that we were dealing with a primary peritonitis. Upon further examination a large mass was felt, which at first appeared to be a large intussusception with gangrenous bowel. Upon more complete exposure it was found that the mass was a large multilocular cyst contained within the great omentum. When the cyst was delivered outside the abdomen it was about as large as an infant's head. One of the cysts had ruptured, accounting for the free fluid and the peritonitis. The cyst originated high on the omentum, close to the transverse colon. The cyst was partially extirpated, the omentum clamped at the base and the cyst very easily removed. The gallbladder, stomach, and duodenum appeared normal. The appendix was removed. No cysts were seen in the pelvis. The abdominal wall was closed in layers, with a Penrose drain to the pelvis.

---

*Read before Janney Children's Hospital Staff, Minneapolis, March 3, 1931.

Upon opening the remaining cyst perhaps another quart of dark, greenish fluid was obtained, which chemically proved to contain blood pigment.

Postoperative diagnosis: Multilocular omental cyst.

Pathological report, by Dr. J. S. McCartney: The tumor of the omentum is a collapsed cystic mass eighteen by six and five-tenths by three and five-tenths centimeters; it is composed chiefly of two large cysts and one small one. One of the large cysts has a hemorrhagic lining. The lining of the other large cyst is pale. The large cysts have trabeculated inner surfaces. In the omentum at a point about five centimeters from the main mass are two other cysts, each about one centimeter in diameter. Section of the cyst with the hemorrhagic wall shows an indistinct endothelial lining and a marked subacute inflammation beneath this endothelium. Section of the wall of the pale cyst shows very definite endothelial lining, but no evidence of inflammation. No epithelium is found in any of the sections. The diagnosis is cyst of the omentum probably of lymphatic origin.

These cysts are lymphatic in nature, and probably congenital in origin.

MEDICAL ARTS BUILDING.

THROMBOPLASTIN HYPODERMIC-SQUIBB OMITTED FROM N.N.R.

Thromboplastin Hypodermic-Squibb is a sterilized extract of cattle brain in physiologic solution of sodium chloride intended for hypodermic injection to increase the coagulability of the blood. The Council on Pharmacy and Chemistry first accepted thromboplastic substances in 1915. Since then little or no additional evidence has developed for the value of these preparations: their intravenous use almost certainly presents dangers, and the Council has become convinced that there is no satisfactory evidence for their effectiveness when injected subcutaneously. In view of this the Council decided, unless new evidence should appear, not to include hereafter in New and Non-official Remedies any preparation of this type except for local application. Since Thromboplastin Hypodermic-Squibb is intended for hypodermic or subcutaneous injection, E. R. Squibb & Sons were informed of the action of the Council and asked to submit evidence in support of the value of the hypodermic administration of thromboplastic substance. The submitted evidence did not permit a revision of the Council's conclusion that the hypodermic or subcutaneous administration of Thromboplastin Hypodermic-Squibb or of other thromboplastic substances is not therapeutically valuable and therefore omitted the Squibb preparation from New and Non-official Remedies. (Jour. A. M. A., February 21, 1931, p. 613.)

PRESIDENT'S LETTER

IN an association like ours, with its multiple interests partaking equally of scientific advancement and public obligations, some liaison officer between the individual society and its various official activities is highly desirable.

We have such liaison officers in our councilors. They know the business of the organization intimately. They can supply the color and intent back of the dry, uncolored reports of official conferences and delegates' meetings that are all that otherwise reach remote county societies. They could be used to knit us all much more intimately and solidly together in spite of our scattered far-flung situation. The question is, why don't we use them?

When the councilors met at the May meeting of the Association in Minneapolis, several reported there that their councilor duties were curiously restricted. They could not keep their districts properly informed. They could not suggest or advise. They were not so invited. Of course the reason was not that the societies in question disliked inviting councilors to their meetings. Probably the societies in question entirely overlook the fact that there are councilors in their districts.

The House of Delegates meeting in Minneapolis was packed to overflowing with important business, vital business about which every member of the association should have an intimate knowledge. House of Delegates' decisions and reactions to decisions, this ye and the next and the next, are going to affect the practice of medicine very vitally in these changing troublous times in Minnesota. Are all of the members of our great organization going to be satisfied with the clipped, official accounts of resolutions passed and committee reports accepted?

The councilor of your district took an active part in the transaction of the business of the last meeting. Invite him in to tell you about it. Never mind how busy he is. When he accepts his important post he is prepared to make personal sacrifices in the interest of the profession. He will be glad if you call on him. It will be eminently worth your while.

Witness the report of one of the new members of the Council, O. J. Hagen of Moorhead, submitted at the May Council meeting. Dr. Hagen had more invitations to visit societies in his district than he was able to accept, since several of the dates conflicted. Since early in 1931, however, when he took office, he visited the Clay-Becker Society, the Park Region Society and the Red River Valley Society.

"In Clay-Becker there is manifested a healthy coöperative interest in both the scientific and public aspects of the medical profession," Dr. Hagen reported. "A special meeting was called to discuss the legislative problems of the association that arose during the legislative session so that a local viewpoint might be intelligently expressed. This showed a wholesome trend. It helps so much to crystallize the profession into a compact unit of thinking and performance."

Of the Park Region meeting, Dr. Hagen said: "The scientific meeting was of a high order; the discussion on increasing the membership sensible; the fine spirit of comradeship encouraging."

Of the Red River Valley Meeting: "These giants of the North have always given a large contribution to medicine in its highest sense; they are intensely alive to problems of legislation and public health.

"I am confident that the Eighth District is in a healthy state of cultivation and that they will continue to make their contribution in the future as in the past a very, very impressive one."

Here is an example of a valuable relation between a councilor and his district. It should prevail everywhere throughout our association.

And don't forget that there is another new and particular service your councilor can perform for you this year. Two new studies, one on medical economics and the other on industrial practice, have been added to the state program for the new year. The time has come, as you know, in the practice of medicine in America, when the physician can no longer leave it to chance or the lay economist or the ambitious welfare worker to determine upon reforms in the system of caring for the sick.

These studies undertaken by our own members will provide us with authentic reliable information about conditions in our own state, information that must be the basis of all the future public policy of our societies.

The two committees who will carry on the work were appointed by the Council. The Council and therefore your councilor will be constantly informed on their findings.

Why wait to get such information second hand?

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

EDITING AND PUBLISHING COMMITTEE
A. S. HAMILTON, M.D.....Minneapolis
D. C. BALFOUR, M.D.....Rochester
J. T. CHRISTISON, M.D.....St. Paul
E. L. GARDNER, M.D.....Minneapolis
JOHN M. ARMSTRONG, M.D.....St. Paul
R. E. FARR, M.D.....Minneapolis

CARL B. DRAKE, M.D., St. Paul.....Editor
Lewis M. Daniel, M.D., Minneapolis.....Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna.....First District
F. M. Manson, M.D., Worthington.....Second District
Geo. B. Weiser, M.D., New Ulm.....Third District
H. B. Aitkens, M.D., LeSueur Center.....Fourth District
F. U. Davis, M.D., Faribault.....Fifth District
E. L. Gardner, M.D., Minneapolis.....Sixth District
Paul Kenyon, M.D., Wadena.....Seventh District
O. E. Locken, M.D., Crookston.....Eighth District
E. L. Tuohy, M.D., Duluth.....Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV July, 1931 No. 7

THE EARLY DETECTION OF TUBERCULOSIS

While the mortality from tuberculosis has been halved in the past decade, it is common knowledge that there has been little or no reduction in this mortality among girls in the teen age. The infectiousness of the disease, mode of transmission, and the frequency of childhood infection are well understood, and yet prevention of infection is far from satisfactory.

In the interests of early detection of tuberculosis, the National Tuberculosis Association, of which the Minnesota Public Health Association is a component part, is advocating universal investigation of school children by means of the Mantoux tuberculin test and X-ray examination of the lungs in positive reactors. This presupposes a practically 100 per cent accuracy for the Mantoux test and a universal agreement as to the interpretation of lung shadows in children. It is perhaps needless to state that a diagnosis of the presence of active tuberculosis which depends on these two methods alone is unreliable. History, physical examination, and sputum analysis are still indispensable.

Groups of school children in Minnesota have been and are being investigated by various local agencies to determine the incidence of positive Mantoux reactors and undetected tuberculosis. An occasional case of active tuberculosis has been discovered in various localities.

The importance of picking up unsuspected active tuberculosis by every possible method cannot be over-estimated. Even though these surveys tread on the toes of private practice, the practitioner will not object to such a method if it is the only practical way to detect unrecognized cases. An individual with undetected active pulmonary tuberculosis is nobody's patient at a time when diagnosis is all-important. Whether the surveys mentioned should be extended to provide for universal free examinations for tuberculosis is open to some question.

Some doubt has been expressed as to the value of a positive tuberculin reaction in selecting individuals for further investigation. Eberson, Delprat, and Wolff,[*] while recognizing the value of tuberculin and the X-ray in the diagnosis of pulmonary tuberculosis, concluded from a study of groups of positive and negative tuberculin reactors that tuberculin cannot be counted on to exclude the non-tuberculous. The authors report, too, that single findings of hilus calcification, increased lung markings, enlarged bronchial lymph nodes and peribronchial infiltration as shown by the X-ray plate occurred more often in the group not reacting to tuberculin. Certainly there is no agreement at present in the interpretation of hilus shadows in childhood.

---

[*] Eberson, F., Delprat, Jessie P., and Wolff, E.: Suspected juvenile tuberculosis. Am. Jour. Dis. Child., 40:753 (Oct.), 1930.

The manner in which a survey of this sort is conducted is very important. All human beings are concerned to some degree about their physical well-being—children as well as adults. Perhaps most of us have just a little neurotic tendency. To be told that a skin test shows a tuberculous infection may not be the best thing in the world for many individuals. To be told further that an X-ray of the lungs is advisable because of the skin test and then that the X-ray is not normal (and how often calcified hilus areas are reported) is only too likely to bring out neurotic tendencies. A survey of apparently normal individuals should provide that findings be reported to medical advisors for evaluation. Their significance should be determined in conjunction with the history and physical examination by the attending physician. By this means only will a false diagnosis of tuberculosis be prevented and needless treatment avoided. Who knows but what a positive tuberculin reaction is indicative of a vaccination and of increased resistance to further infection?

"DOC" WILLIAMS

The passing of "Doc" Williams recalls the colorful career of one of Minnesota's prominent physicians. His name will be handed down in the annals of athletic history in connection with his outstanding activities at the University of Minnesota. He was a physician who found time to do more than practice medicine and to do that something well.

A Yale athlete of outstanding ability in track as well as football, he continued his interest in athletics continuously after graduation; as coach to preparatory schools and for a brief period at West Point. When Minnesota with plenty of material but scant football coaching was unheard of in collegiate athletics, he put the university on the football map by developing such all-Americans as Johnny McGovern, James Walker, and Bert Baston.

"Doc" Williams acquired national prominence in football circles through his famous Minnesota shift. He helped organize the American Intercollegiate Athletic Association and proposed the rule which introduced the forward pass into the game. The same vigor and punch which he instilled into his men he exhibited in his interest in the game, and success was his.

OF GENERAL INTEREST

Dr. A. R. Johnson, formerly of Eveleth, Minnesota, is now located at Isanti, Minnesota.

Dr. O. E. Sarff, formerly located at Baudette and Warroad, is now practicing at Roseau, Minnesota.

Dr. Frank Grawn, formerly of Duluth, is now practicing at Northome, Minnesota.

Dr. Bernard E. O'Reilley has opened offices at 1267 Lowry Medical Arts Building, St. Paul, and is specializing in eye, ear, nose, and throat diseases.

Dr. Donald A. Dukelow after June 15 will be located at St. Charles, Minnesota. Dr. Dukelow was formerly associated with the Mayo Clinic at Rochester.

On May 19, 1931, the following officers of the Minnesota Pathological Society were elected: Dr. J. F. Noble, president; Dr. J. S. McCartney, vice president; Dr. E. F. Bell, secretary-treasurer.

Announcement has been received of the association of Dr. Arthur E. Perley, formerly of the Nicollet Clinic, Minneapolis, with Dr. Harold Swanberg of the Quincy X-ray and Radium Laboratories, Quincy, Illinois.

The offices of the Minnesota State Board of Examiners in the Basic Sciences have been moved from 110 Anatomy Building to 126 Millard Hall, University of Minnesota, Minneapolis. Dr. J. C. McKinley is secretary-treasurer of the Board.

Dr. Ivar Sivertson of Minneapolis was appointed a member of the State Board of Medical Examiners for a term ending May 1, 1938. He succeeds Dr. C. E. Kaine of Morris. The appointment was made by Governor Olson upon recommendation of the State Medical Association.

The following were elected Affiliate Fellows of the American Medical Association at the Philadelphia meeting: S. S. Hall, Minneapolis; L. K. Onsgard, Houston; E. S. Strout, Minneapolis; Chas. A. Van Slyke, Saint Paul; Ed. H. Whitcomb, Saint Paul; Warren Wilson, Northfield; W. F. Wilson, Lake City.

According to a newspaper report, hospitals operated by the Northern Pacific Railway Beneficial Association cared for 33,667 patients in 1930. The total number of hospital and non-hospital cases amounted to 76,089. Hospitals are operated in Glendive, Missoula, Tacoma, and Saint Paul. Some 17,935 patients were treated by the Saint Paul unit.

Dr. Richard E. Scammon, who left the University a year ago to become dean of medicine and biological sciences at the University of Chicago, will return in the fall to be dean of medical sciences, a new position created by the Board of Regents. Dr. E. P. Lyon will continue as dean of the medical school while Dr. Scammon's duties will include stimulating interest in medical science in the other departments of the University as well as in the medical school.

The Millard Memorial Fund being collected by the Minnesota Medical Alumni Association for the erection of a suitable memorial for Dr. Millard's grave at Stillwater, is growing and the response on the part of the profession has been gratifying. Further contributions, however, are desired. Those who have as yet not responded to the request sent out a month ago are requested to send their contributions to Dr. Ralph Creighton, Medical Arts Building, Minneapolis.

Frederick Bass, member of the Engineering faculty at the University, was appointed to succeed Dr. S. Marx White of Minneapolis, and Dr. C. T. Oliver of Graceville to succeed Dr. C. F. Melby of Thief River Falls on the board. Arthur S. Milinowski of Stillwater, a sanitary engineer with offices in St. Paul, was also appointed to succeed L. P. Wolff, also an engineer in St. Paul. The appointment of the engineers was made upon recommendation of engineering societies.

The University Hospital and the Minneapolis General Hospital are each offering a six months' course of training in anesthesia to graduate nurses. One new student is entered at each hospital on the first of February, May, August, and November. Maintenance during the course is furnished.

The course is supervised by Dr. Ralph T. Knight and practical instruction furnished by the chief anesthetist and her assistants. The administration of nitrous oxide, ethylene, ether, and chloroform and the care of patients receiving spinal anesthesia are taught. After two weeks of observation and instruction the student administers anesthesia under supervision for three months.

Formal presentation of the medal offered by the Southern Minnesota Medical Association, for the best scientific exhibit at the meeting of the Minnesota State Medical Association, will take place at Faribault, Minnesota, on August 29, at the meeting of the Southern Minnesota Medical Association.

The award goes to Dr. William P. Herbst of Minneapolis for his exhibit on "A Study of the Motility of the Upper Urinary Tract Demonstrating the Diagnostic Features of Abnormal Motility Syndromes and the Indications of Drug Therapy and Renal Sympathectomy."

Honorable Mention was given to Dr. R. K. Ghormley, Dr. B. R. Kirklin and Dr. E. A. Brav of Rochester for their exhibit, "A Study of Surgical Specimens of the Knee Joint."

OBITUARY

HENRY L. WILLIAMS

1869–1931

Dr. Henry L. Williams, for twenty-two years coach of the University of Minnesota football teams, died June 14, 1931, at the age of sixty-two.

Born July 26, 1869, in Hartford, Connecticut, of English stock, Dr. Williams attended the public schools of Hartford and entered Yale in 1887. As an undergraduate he won his letters in football and track and the all-round track championship in his junior year. In his senior year he was captain of the track team.

After graduation he taught at a preparatory school ten miles from West Point, and besides coaching the preparatory teams went to West Point on Saturday afternoons to coach the Army teams.

Dr. Williams graduated from the medical school of Pennsylvania with honors in 1892 and spent three summers in post-graduate work in Germany.

From Philadelphia he came to Minneapolis in 1900 to become coach of the University track and football squads. In addition he practiced medicine and in 1912 became Assistant Professor of Gynecology, then resigned the following year to devote his spare time to private practice. For eight years "Doc" Williams coached the track teams but continuously acted as head coach of football until 1921, when a full-time coach was demanded.

Following the World War, Dr. Williams became executive in the Veterans Bureau headquarters in Minneapolis and later became District Medical Director for the United States Fidelity and Guaranty Company.

MORE MISBRANDED NOSTRUMS

The following products have been the subject of prosecution by the Food and Drug Administration of the U. S. Department of Agriculture, which enforces the Federal Food and Drugs Act: Antikamnia and Codeine Tablets (Antikamnia Remedy Co.), each containing 2.88 grains of acetanilid with caffeine, sodium bicarbonate and a small amount of codeine. A-No-Mor (A. G. Luebert), capsules containing 3 grains acetphenetidin, some acetylsalicylic acid and caffeine. Sargon (Sargon Laboratories), an alcohol-water solution of sugar, glycerin, extract of ox gall, a bitter drug, small amount of an iron compound, sodium citrate and caffeine. Gauvin's Headache Wafers (J. A. E. Gauvin), containing acetanilid and sodium bicarbonate. Hygem (Vita-Bac Corporation, Bloomfield Laboratories), consisting essentially of an emulsion of mineral oil, a small amount of casein-like material and water, flavored with peppermint oil and containing no viable acidophilus bacilli. Now (R. D. Coulson), consisting essentially of small amounts of menthol, camphor, oil of eucalyptus, licorice, alcohol, glycerin and water. Acquin (Clausen-Zoller Co.), containing acetphenetidin, acetylsalicylic acid and starch. (Jour. A. M. A., January 3, 1931, p. 57.)

« A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

"The Literary Digest Picks a Doctor"

Apparently there is still something seriously amiss with public knowledge of the functions of organized medical societies.

A certain C. Houston Goudiss of the New York *Forecast* has some excellent ideas about how to tell a quack when he sees one.

Neither he nor a *Literary Digest* commentator seems to know just how to go about picking an honest medical man.

The *Literary Digest* of May 30, 1931, was so much interested in Mr. Goudiss' ideas as published in the *Forecast* articles that it picked them up bodily, adding certain comments of its own and heading the combination with the caption, "HOW TO PICK A DOCTOR."

Suppose, they say, that you are alone and sick in a big city and there is not even a helpful hotel clerk downstairs to send up the hotel physician. What can you do to get a responsible properly qualified city substitute for the "old family doc" you left behind you?

How *do* you pick a doctor, in other words, according to the *Digest* and Mr. C. Houston Goudiss?

Well, here's how: you call the Young Women's Christian Association, or the Young Men's Christian Association, the Young Men's Hebrew Society, the local Rotary Club or the nearest hospital.

This last, says Mr. Houston Goudiss sagely, is your best bet because hospitals of any size, in any community, are required by law to maintain certain standards.

You tell by the following signs whether you have got hold of a quack or not: demands for money in advance; claims of a "special system" for all troubles; claims of some secret remedy or cure. All these should make you suspicious, says Mr. Goudiss. They are prima facie evidence of a faker.

The prima facie evidence of an honest regular practitioner is apparently much harder to describe. You must call this or that or the other lay organization to find out about him, or you must put in a claim for attention from some busy hospital.

These two may be taken to possess at least average intelligence and the average amount of information. What is the matter with the public relations of organized medicine, that neither had apparently ever heard of a county medical society?

They know, for instance, that a reputable practitioner must have got his degree from a reputable school; that he will be a member of reputable medical societies. But they know no simple way of checking up on either of these details.

Instead they counsel the sick, in need of more immediate attention, to call up the welfare organizations or a hospital to get their information second hand.

What about the general public if these men are so grossly uninformed?

County medical societies are enlarging and strengthening their organizations as never before. They are adding special committees for this type of public relation, other committees for that. They are more conscious and better equipped to take care of their public obligations than ever before.

Yet a large section of the public still knows nothing of the most fundamental and elementary service the county medical society has to offer—that of identifying and certifying honest physicians and protecting the public against quacks.

"Be suspicious," says the Goudiss article, in conclusion. "If you are sufficiently so, you will not entrust your most valuable possession to a faker. And if you insist upon having the facts you will go far toward the laudable goal of discouraging and eventually ridding our land of quacks."

The medical profession should certainly inform Mr. Goudiss just how it is prepared to assist his laudable campaign for discouraging quacks.

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

ST. PAUL NATUROPATH FOUND NOT GUILTY ON ABORTION CHARGE

State of Minnesota *vs.* Hirst

William H. Hirst self-styled Naturopath with offices at 138 East Sixth Street, St. Paul, was found not guilty on an abortion charge by a jury after five hours' deliberation in the Court of the Honorable Howard Wheeler. The trial was the second one for the offense charged, the first trial ending in a disagreement after he jury had deliberated forty-three hours. The state alleged that the abortion took place on January 5, 1931. Following the defendant's arrest on that charge he entered pleas of guilty to two violations of the Basic Science Law, paying $500 fine on one charge and receiving a suspended sentence of one year in the Workhouse on the other. The Workhouse sentence was suspended on the condition that the defendant refrain from practicing healing in any manner in this State.

The present trial was conducted by Mr. John A. Pearson and Mr. James F. Lynch, assistants to Michael F. Kinkead, County Attorney. Mr. Brist, representing the State Board of Medical Examiners, reports that the case was very ably and conscientiously tried by Mr. Pearson and Mr. Lynch. The Honorable Howard Wheeler, Judge of the District Court, who presided at the trial, was very fair and impartial in the trial of the case.

MINNEAPOLIS QUACK PLEADS GUILTY TO VIOLATING THE BASIC SCIENCE LAW AND DISTRIBUTING PAMPHLETS ON RESTORATION OF "LOST MANHOOD AND LOST WOMANHOOD"

State of Minnesota vs. Ebeling (two cases)

On June 10, 1931, E. F. C. Ebeling, sixty-five years of age, self-styled doctor, entered two pleas of guilty to violating the Basic Science Law and the Statute against publishing and circulating circulars and pamphlets on the restoration of lost manhood and lost womanhood. The defendant had previously been given a warning by the State Board of Medical Examiners but failed to heed the same. His place of business was at 629 Third Avenue South, Minneapolis.

Following his arrest on May 26, defendant was unable to raise bail in the sum of $1,500, and he was confined in the county jail of Hennepin County for a period of fifteen days. At the end of that time he decided to plead guilty before the Honorable Judge Mathias Baldwin of the District Court, at which time he paid a one hundred dollar fine for maintaining an office in violation of the Basic Science Law, and was given a one year sentence in the Minneapolis Workhouse, which sentence was suspended for a period of two years on condition that he refrain from violating the Medical Laws of this State.

Mr. Brist, representing the State Board of Medical Examiners, reports very good coöperation from Mr. Ed. J. Goff, recently elected County Attorney of Hennepin County, and his assistants, Mr. Neilson and Mr. Poirier. Judge Clyde R. White of the Municipal Court, who presided at the preliminary hearing of the defendant, and Judge Mathias Baldwin, before whom the case was disposed of in the District Court, were very fair in their attitude towards these two cases.

This is the first time since the passage of the Basic Science Law that the Medical Board has instituted proceedings under the Statute on advertising of a treatment for the restoration of lost manhood and lost womanhood. The Statute in question is set out below for the convenience of the members of the medical profession. The Medical Board will appreciate receiving any literature that comes to the attention of the members of the profession in violation of this law.

Sections 10191, 10192 and 10193, Mason's Minnesota Statutes for 1927.

10191. CERTAIN MEDICAL ADVERTISEMENTS—PENALTY—Any person who shall advertise, in his own name or the name of another person, firm or pretended firm, association, corporation or pretended corporation, in any newspaper, pamphlet, circular, or other written or printed paper, or the owner, publisher, or manager of any newspaper or periodical who shall permit to be inserted or published in any newspaper or periodical owned or controlled by him, the treatment or curing of venereal diseases, the restoration of "lost manhood" or "lost vitality," or shall advertise in any manner that he is a specialist in diseases of the sexual organs, or diseases caused by sexual weakness, self-abuse, or excessive sexual indulgence, or in any disease of like causes, or who shall advertise in any manner any medicine, drug compound, appliance or any means whatever whereby it is claimed that sexual diseases of men and women may be cured or relieved, or miscarriage or abortion produced, shall be guilty of a gross misdemeanor and shall be punished by a fine of not less than fifty dollars nor more than five hundred dollars or by imprisonment in the county jail for not more than six months. ('09 c. 162 Sec. 1) (8709)

10192. PUBLICATION, ETC.—PENALTY—Any person publishing, distributing, or causing to be distributed or circulated, any of the advertising matter herein above prohibited shall be guilty of a misdemeanor and punished as prescribed in section 1 of this act. ('09 c. 162 Sec. 2) (8710)

10193. EVIDENCE—The production of any advertisement or advertising matter published or distributed contrary to the provisions of this act shall be of itself prima facie evidence of the guilt of the person or persons advertising to cure any such disease herein above mentioned, or of the publishers who publish any matter such as is herein prohibited. ('09 c. 162 Sec. 3) (8711)

NEGRO QUACK SENTENCED ON TWO CHARGES

State of Minnesota *vs.* Robert McGraw (2 cases)

Robert McGraw, sixty-five years of age, a negro quack who formerly practiced at Hewitt and Villard, Minnesota, was arrested on Monday, June 8, at Winsted, Minnesota, charged with violating the Basic Science Law. McGraw was previously tried on two occasions before Judge Flaherty at Glenwood for violating the medical laws of this state, but at each trial Judge Flaherty dismissed the case when the State rested. The State Board of Medical Examiners was informed that McGraw had located in McLeod County and he accordingly was arrested by complaint filed by Mr. Brist, representing the Board. On Thursday, June 11, a second complaint was filed against McGraw because of Mc-

Graw's attempting to cure a case of Hodgkin's disease This case had been previously diagnosed by Dr. Chester J. Olson of Belle Plaine, Minnesota, as Hodgkin's disease with the usual prognosis. This did not prevent McGraw, however, from agreeing to cure the ailment within three months.

Upon the recommendation of Wm. O. McNelly, County Attorney, of McLeod County, Judge Kohler of the Municipal Court at Glencoe set McGraw's bail at $2,000. McGraw was unable to raise this bail and he was accordingly confined in the county jail at McLeod County. The next term of Court in Glencoe is in November and this may have been a factor in McGraw's deciding to plead guilty.

On Friday, June 12, McGraw entered pleas of guilty to both charges before the Hon. C. M. Tifft. Judge Tifft fined McGraw $225 and costs of $13.25 on the first charge, which fine was paid. Defendant seemed to be short of ready cash, for he sold his automobile in order to pay the fine. On the second charge Judge Tifft sentenced McGraw to one year in the county jail of McLeod County, and suspended the sentence on the following conditions:

1. McGraw is to return immediately to his native state of Illinois.
2. He is to refrain from the practice of healing in the State of Minnesota.
3. He is not to return to this state except that he is given forty-eight hours to come in and get his ten-year-old boy who is ill with the measles. When the boy is well McGraw is to be notified and he is to report to the Sheriff of McLeod County when he comes in to get the boy and when he leaves, which period of time is not to exceed forty-eight hours.
4. The Court expressly reserved the right to revoke the suspension of the sentence at any time the Court sees fit, either for cause or without cause.

Judge Tifft warned the defendant against attempting to practice in his home state of Illinois or anywhere else unless he was licensed.

McGraw said that he had spent $2,500 in the past three years fighting these cases and for that reason he was not hiring a lawyer for this case.

This brings to a close three years of work on the part of the State Board of Medical Examiners to eliminate one of the most vicious quacks in the State of Minnesota. The defendant is an unkempt, illiterate quack whose riddance is a blessing not only to the people of this State but to the medical profession as well. The medical profession owes a debt of gratitude to the men who brought about the successful termination of this matter and particularly Judge Kohler of the Municipal Court at Glencoe, John Luiten, Clerk of the District Court, Wm. O. McNelly, County Attorney of McLeod County; Sheriff Alfred T. Beihoffer of McLeod County and the Honorable C. M. Tifft, Judge of the District Court, Glencoe, Minn. The coöperation displayed by Sheriff Beihoffer and County Attorney McNelly and the conditions imposed by Judge Tifft in suspending the jail sentence, clearly shows that there authorities will not tolerate any such quackery in their district.

NEW AND NON-OFFICIAL REMEDIES

The Council on Pharmacy and Chemistry has accepted the following:

Hixson Laboratories, Inc.
  Rabies Vaccine (Hixson)
Lederle Laboratories, Inc.
  Concentrated Pollen Antigen (Lederle) Ragweed
  Combined Diphtheria Toxin for Schick Test in Peptone Solution
Eli Lilly & Co.
  Diphtheria Toxoid-Lilly
  Syrup No. 112 Ephedrine Hydrochloride
Chas. Pfizer & Co.
  Calcium Gluconate-Pfizer
Spicer & Co.
  Quiniobine
  Quiniobine Ampules, 2 c.c.
E. R. Squibb & Sons
  Grasses Combined Pollen Allergen Solution-Squibb
  Cottonwood Pollen Allergen Solution-Squibb

The following articles have been exempted and included with the List of Exempted Medicinal Articles (New and Non-official Remedies, 1930, p. 477):

Hixson Laboratories, Inc.
  Diphtheria Antitoxin
  Tetanus Antitoxin

TRUTH ABOUT MEDICINES

Mead's Powdered Brewer's Yeast.—Dried brewer's yeast harvested under aseptic conditions; it assays approximately 13 vitamin B_1 units per gram and approximately 1 vitamin B_2 units per gram. The product is proposed for prophylaxis and treatment of conditions arising from deficiency of the vitamin B complex in the diet. It is also proposed as a means of stimulating the appetite and growth and for a beneficial effect in lactation. Mead Johnson & Co., Evansville, Ind. (Jour. A. M. A., May 2, 1931, p. 1477).

Diphtheria Toxoid.—A diphtheria toxoid (New and Non-official Remedies, 1930, p. 364) prepared from diphtheria toxin by treatment with formaldehyde. It is marketed in packages of one immunization treatment and in packages of fifteen immunization treatments. Eli Lilly & Co., Indianapolis.

Ampules Solution of Nupercaine-Ciba, 25 c.c.—A 1:1,000 solution of nupercaine-Ciba (Jour. A. M. A., March 21, 1931, p. 946). Ciba Co., Inc., New York.

Schieffelin Psyllium Seed.—A brand of psyllium seed-N.N.R. (New and Non-official Remedies, 1930, p. 311). Schieffelin & Co., New York. (Jour. A. M. A., May 16, 1931, p. 1694.)

Diphtheria Toxin for Schick Test in Peptone Solution.—A diphtheria toxin (New and Non-official Remedies, 1930, p. 380) made by growing diphtheria bacilli in broth, aging and diluting with peptone solution according to J. E. Bunney. The product is ready for use. It is marketed in packages of one syringe containing diluted diphtheria toxin sufficient for one est and in packages of one vial containing sufficient for en tests. As a means of control, diphtheria toxin heated to 75 C. and diluted with peptone solution is supplied. Lederle Laboratories, Inc., Pearl River, N. Y.

Pollen Allergen Solutions-Squibb.—The following pollen allergen solutions-Squibb (New and Non-official Remedies, 1930, p. 27; Jour. A. M. A., December 20, 1930, p. 1913), marketed in 5 c.c. vials, has been accepted: Cottonwood Pollen Allergen Solutions-Squibb. The following pollen allergen solutions-Squibb (New and Non-official Remedies, 1930, p. 27; Jour. A. M. A., December 20, 1930, p. 1913), marketed in 5 c.c. vials, in treatment set packages, A, B, C and D, and in three vial treatment packages, has been accepted: Grasses Combined Pollen Allergen Solutions-Squibb (Bermuda Grass, June Grass, Orchard Grass, Red Top, and Timothy, in equal parts). E. R. Squibb & Sons, New York. (Jour. A. M. A., May 30, 1931, p. 1872.)

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Zed Biscuits (Zed Corporation, San Francisco, Calif.).—Twice baked biscuits, leavened with baking powder, containing cracked whole wheat, whole wheat flour, rye meal, oat meal, wheat bran, bread flour, coconut oil, buttermilk (cultured), caramelized sugar, brown sugar and a mixture of orange, pineapple, grape and apple juices. Zed biscuits are claimed to be wholesome, nutritious, regulative and delicious.

Merrell-Soule Powdered Cultured Skimmed Lactic Acid Milk (Akrelac) (Merrell-Soule Co., Inc., New York).—This is a powdered artificial buttermilk, soured with pure culture of lactic acid organisms *(Streptococcus lactis)*. The use of the product is proposed by the manufacturer to rectify digestive disturbances under artificial feeding, for acute intestinal disturbances, prolonged malnutrition, and complemental feeding.

Wheatena (The Delicious Wheat Cereal) (The Wheatena Corporation, Wheatenaville, Rahway, N. J.).—A toasted granular wheat cereal composed of the embryo, essentially all of the endosperm and the major portion of the bran of red winter wheat. Wheatena is claimed to be a quick cooking wheat breakfast cereal with an individual toasted flavor requiring from two to three minutes for preparation. (Jour. A. M. A., May 2, 1931, p. 1478.)

Olde-Tyme Breads (Family, Round, Hearth and Pullman) (The City Bakery, Bellefonte, Pa.).—White bread loaves in wax-paper or "glassine" wrappers.

Sliced Purity Bread (Purity Baking Co., Ottawa, Ill.).—A sliced white bread made by the sponge dough method.

Merrell-Soule Powdered Protein Milk (Boilable) (The Merrell-Soule Co., Inc., New York).—A powdered food made from milk; higher in protein and mineral salts, lower in lactose than dry whole milk. It is only slightly acid. The preparation is proposed for use in infant feeding.

Amaizo Golden Syrup (Corn Syrup and Refiners' Syrup) (American Maize-Products Co., New York).—A blend of corn syrup and refiners' syrup flavored with vanilla extract. (Jour. A. M. A., May 16, 1931, p. 1695.)

Mead's Powdered Lactic Acid Milk Noncurdling No. 1 with Dextri-Maltose (Mead Johnson & Co., Evansville, Ind.).—A powdered, spray-dried homogenized milk containing added lactic acid, maltose and dextrin. It is claimed that the mixture with water may be boiled without curdling or change of color or taste. It is proposed for use in infant feeding.

Libby's Tomato Juice (Libby, McNeill & Libby, Chicago).—A pasteurized tomato juice, seasoned with salt. It is claimed that the method of preparation tends to retain the vitamins of the original fruit. It is claimed that the product is a food which stimulates the appetite and that, like orange juice, it is a protective food against scurvy.

Self Rising Washington Flour (Wilkins-Rogers Milling Co., Washington, D. C.).—A mixture of wheat flour with baking powder leavening and seasoning—calcium acid phosphate, sodium bicarbonate and salt. The flour is claimed to be adapted to biscuit, pastry and cake baking. (Jour. A. M. A., May 23, 1931, p. 1780.)

Jerry's Kew-Bee Bread (Jerry's Bakery Co., Terre Haute, Ind.)—A white bread made by the sponge dough method.

Page Evaporated Milk (Sterilized, Unsweetened) (The Page Milk Co., Merrill, Wis.).—An unsweetened evaporated milk. A mixture of one part water and one part of this product corresponds to the legal standard for whole milk.

Vermont Maid Bread (Vermont Baking Co., White River Junction, Vt.).—A white bread made by the sponge dough method.

Staley's Golden Table Syrup (A. E. Staley Manufacturing Co., Decatur, Ill.).—A table syrup; a corn syrup base (glucose) flavored with choice refiners' syrup.

Staley's Crystal White Syrup (A Savory Blend of Pure Corn Syrup, Granulated Sugar Syrup and Vanilla) (A. E. Staley Manufacturing Co., Decatur, Ill.).—It is a mixture of corn syrup base (glucose) and sucrose flavored with vanilla extract. (Jour. A. M. A., May 30, 1931, p. 1872.)

Velveeta (Kraft-Phenix Cheese Corporation, Chicago).—A delicious cheese food. Kraft Process American Cheese with added milk sugar, milk minerals and water. A cheddar cheese admixed with cream (or butter and skim milk powder), milk-whey powder and salt. The approximate composition is: moisture, 44 per cent; ash, 6 per cent; fat, 25.5 per cent; protein, 18 per cent; lactose, 6.3 per cent; calcium, 0.53 per cent; phosphorus, 0.71 per cent; 75 mg. of Velveeta is equivalent to 10 mg. of butter in Vitamin A potency. Velveeta is claimed by the manufacturer to be richer in milk minerals and lactose than the usual cheeses not containing the milk-whey. (Jour. A. M. A., March 21, 1931, p. 947.)

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—Five weeks ago, a woman, 28 years old, married six months, never pregnant, woke up at 5:00 A. M. with a severe pain in the right hip region. It was exquisitely tender. Pressure along the course of the sciatic nerve was very painful. Deep pressure over the long bone was not so distressing. There was no elevation of temperature until one week later, when her temperature rose to 100 for a day or two and then went to normal; stayed normal for four days and since then has been of the intermittent type. The highest point was 101.5 and the lowest 98. The pulse has been around 80 for two weeks. During the last two weeks it has become more rapid and for the past five days has been rather constant at 120 beats per minute.

Physical examination has been negative all along. No cardiac findings. Shifting tenderness over the right leg is getting general. Pain extends to the shoulders, the back and sometimes just from the knee to the ankle.

Last week she had four definite chills in five days. The temperature did not go up above 101.5 but there was an increase in the pain along with the chill. None of the joints has ever showed any signs of redness or swelling.

Two days ago, she began to have dysuria with frequency, passing three or four ounces every half hour. The urine has been negative daily as far as albumin, sugar, or any other abnormal constituent is concerned. The acidity has been low.

X-ray examination of the bones is negative. Repeated pelvic examinations have yielded no abnormal findings. The white blood count has varied from 8,150 to 14,000. May 15, the hemoglobin report was 60 per cent (Tallqvist), red blood count 4,690,000, white blood count 8,150, and the differential-neutrophils 66 per cent, small lymphocytes 7 per cent, large lymphocytes 26 per cent, transitional cell 1, and no eosinophils nor basophils seen. The large lymphocytes look rather immature to me.

At times the pain was so severe that it required morphine or pantopon of fairly good sized doses. This at times has failed to control it and does not permit very much sleep. The ordinary analgesics have not been of any particular value.

There is no glandular enlargement, even the tonsils are very small. Have noted two small nodules, subcutaneous in location, in the right lower abdominal region. One appeared about ten days ago and the other four days ago. They are about the size of a large pea and are moderately tender to touch.

I would greatly appreciate your opinion in this matter.

Answer.—It is not likely that the suggestive immaturity of the lymphocytes is significant in this case. The differential count showing the usual excess of neutrophils is against any diagnosis of leukemia at this stage. We sometimes see this type of cell in infections but are unable to use it in any way to make a diagnosis.

As far as the subcutaneous nodules are concerned, I would advise you to do a biopsy and have a microscopic section done. This will clear up any relationship to the case.

The diagnostic possibilities are: Arthritis, bone tumor, or osteomyelitis or periostitis. The absence of positive X-ray bone findings is not against any bone or joint diagnosis and I would suggest that you repeat this part of the examination. We frequently see cases early in their course which do not show any findings either of tumor or inflammation. Later plates would show the process very clearly.

The commonest type of bone tumor, associated with severe pain, fever and other signs of infection is Ewing's tumor, which is an endothelioma and involves any part of the skeleton, either in one or several places. An interesting complication frequently seen is simultaneous involvement of the lymph nodes and visceral metastasis.

Pelvic infections, as a general rule, do not cause a severe type of hip pain. The bladder symptoms and location of the pain are suggestive of psoas abscess. Could it be possible that there is anything in the lumbar vertebra? Metastatic bone tumors cannot be ruled out until a careful research has been made for the primary. It is possible that the subcutaneous nodules, that you mention, might be helpful in clearing up this point.

We doubt that it is in any way associated with a leukemic process. Hodgkin's may involve the bone and cause severe pain. Deep visceral Hodgkin's may be present without enlargement of the nodes. Again, a biopsy of the nodules would be helpful.

In our experience, arthritis of the infective type (rheumatic) seldom causes severe pain over such a long period of time as you have noted in your case. Tumors, primary or metastatic, suppurative arthritis, osteomyelitis or periostitis and Hodgkin's disease are more likely.

2. *Question.*—Occasionally I examine the secretions from the prostate gland under the microscope. Usually I find many white cells. Is this normal? Do one-third of all males have prostatic infection?

Answer.—A few white cells is the usual finding. An increase means inflammation. You are right in the statement that about one-third of all males after 30 years of age have prostatic infection, but very few give any trouble.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 10:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and St. Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of July will be as follows:

July 1—Safety First for the Fourth.
July 8—Cause of Albumin in Urine.
July 15—Type I Pneumonia.
July 22—Aims of Education.
July 30—Newer Knowledge of Cancer.

THE AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians will hold its Sixteenth Annual Clinical Session at San Francisco with headquarters at the Palace Hotel, April 4 to 8, 1932. Following the Clinical Session, a large percentage of the attendants will proceed to Los Angeles, where a program principally of entertainment will be furnished April 9, 10 and 11.

Announcement of the dates is made particularly with a view not only of apprising physicians generally of the meeting, but also to prevent conflicting dates with other societies that are now arranging their 1932 meetings.

Dr. S. Marx White, of Minneapolis, is President of the American College of Physicians, and will arrange the Program of General Sessions. Dr. William J. Kerr, Professor of Medicine at the University of California Medical School, San Francisco, is General Chairman of local arrangements, and will be in charge of the Program of Clinics. Dr. Francis M. Pottenger, of Monrovia, is President-Elect of the College, and will be in charge of the arrangements at Los Angeles. Mr. E. R. Loveland, Executive Secretary, 133-135 S. 36th Street, Philadelphia, Pa., is in charge of general and business arrangements, and may be addressed concerning any feature of the forthcoming session.

NORTHWESTERN PEDIATRIC SOCIETY AND STAFF OF CHILDREN'S HOSPITAL—JOINT MEETING

A joint meeting of the Northwestern Pediatric Society and the Staff of the Children's Hospital was held at the Children's Hospital, Saint Paul, May 20, 1931. Thirty-eight members were present.

The meeting was called to order by the President, Dr. Samuel Amberg, at 8:15 p. m. Dr. Amberg suggested that, owing to the length of the program, we dispense with the reading of the minutes of last meeting.

It was moved by Dr. Thomas Myers, seconded by Dr. W. Ray Shannon, that five meetings be held this year: the spring meeting at Saint Paul, the summer meeting at Rochester, the fall meeting in Duluth, the winter meeting at Minneapolis, and the annual meeting at the Town and Country Club, Saint Paul. At these meetings members from other towns have the privilege of presenting papers.

The following clinical program was then presented by the Staff of the Children's Hospital:

1. Spontaneous subarachnoid hemorrhage..................Dr. Critchfield
   Discussion ....Dr. Andrews
2. Chronic suppurative parotitis..........Dr. Birnberg
3. Liver abscess..........Dr. Colby
   Discussion.........Drs. Ikeda, McQuarrie and Shannon
4. Recent progress in child psychiatry....Dr. Lippman
   Discussion ....Dr. Amberg
5. Pediatrics in Ancient Egypt..........Dr. Rosenthal
   Discussion ....Dr. McQuarrie
6. Pulmonary tuberculosis..........Dr. Myers
7. Unusual case of diabetes..........Dr. Ramsey
   Discussion....Drs. Shannon, Andrews and McQuarrie

Alexander Stewart,
Secretary-Treasurer.

REDWOOD-BROWN COUNTY SOCIETY

On Tuesday, May 19, 1931, the Redwood-Brown County Medical Society held its annual meeting at New Ulm. Dinner was served to the doctors and their wives at 6:30 p. m. in the parlors of the Methodist Church, fifty-two being present.

After the dinner all repaired to the home of Dr. and Mrs. Geo. F. Reineke, where the women organized a local chapter of the State Medical Auxiliary, while the doctors held their scientific meeting.

Dr. F. A. Willius, of the Mayo Clinic, delivered an able lecture on "Heart Disease, including the discussion of sudden death." This lecture was illustrated by slides thrown upon the screen by Dr. Monte Piper, also of the Mayo Clinic.

The following officers were elected for the ensuing year: Dr. F. H. Dubbe, New Ulm, president; Dr. A. P. Goblirsch, Sleepy Eye, vice-president; Dr. Wm. A. Meierding, New Ulm (re-elected), secretary-treasurer; Dr. Geo. B. Weiser, New Ulm, state delegate; Dr. J. P. Vogel, New Ulm, alternate; Dr. Theo. Hammermeister, New Ulm (re-elected), censor.

The Chairman appointed the following committees: Publicity, as well as Public Health—Dr. Geo. B. Weiser, New Ulm; Dr. Wm. McLane, Sleepy Eye, and Dr. J. C. Rothenburg, Springfield.

Maternal and Infant Hygiene—Dr. Geo. B. Weiser, New Ulm, and Dr. E. Jamieson, Walnut Grove.

Public Policy and Legislation—Dr. J. C. Rothenburg, Springfield, and Dr. Theo. Hammermeister, New Ulm.

It was decided to have the president appoint a committee of three who were to arrange for more frequent meetings during the year and to arrange for suitable programs. These meetings may be held in various cities and towns providing the local physicians arrange for a suitable meeting place.

A resolution was passed that our society go on record as disapproving of free medical and surgical services being given ex-service men for disabilities not incurred in the service, as this practice is a big step towards socialized medicine.

WM. A. MEIERDING, Secretary.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will be held at Faribault, August 24, 1931, at the Shattuck School. The program this year will be similar to the one given last year in that clinical demonstrations and clinics will be held in the morning with a formal program in the afternoon and a banquet with prominent speakers in the evening. The completed program will be published in the August number of MINNESOTA MEDICINE.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The semi-annual meeting of the Southwestern Minnesota Society was held at Luverne, Minnesota, May 11, 1931. Thirty-three doctors were present. The following program was given:

"State Medical Society"
Dr. L. L. Sogge, Windom, Minn.
"Spinal Anesthesia"
Dr. Sydney Watson, Worthington, Minn.
"Medical Economics"
Dr. C. L. Sherman, Luverne, Minn.
"Report on State Medical Meeting"
Dr. E. W. Arnold, Adrian, Minn.
"The Relation of the Medical Profession to State Senate"
Sen. Frank J. Snell, Adrain, Minn.
"The Attitude of the Medical Profession to Workman's Compensation"
Sen. J. V. Weber, Slayton, Minn.

Rep. John Connell, Luverne, Minn., was also present and gave a very interesting talk.

E. G. MCKEOWN, M.D.,
Secretary.

WABASHA COUNTY SOCIETY

The sixty-third annual meeting of the Wabasha County Medical Society will be held at Lake City, Minnesota, Thursday, July 9, 1931.

Following the business session in the morning dinner will be served at the Hotel Lyon, where members will be guests of the Lake City members and affiliated dentists.

"Minnesota Wild Life in Motion Pictures" will be presented in three reels with a talk by Professor Thomas S. Roberts, Director of the Zoölogical Museum, University of Minnesota.

The scientific program in the afternoon will be as follows:

President's Address—"Further Report on Undulant Fever, with Three Additional Cases." Dr. E. C. Bayley, Lake City
"Tuberculous Salpingitis"—Dr. Alfred Belitz, Pepin, Wisconsin
"Medical Policies Discussed at the 1931 County Secretaries' Meeting"—Dr. W. F. Wilson, Lake City

WASHINGTON COUNTY SOCIETY

The regular meeting of the Washington County Medical Society, which was held Tuesday, May 12, was, in some respects, our most successful meeting. The attendance was good. Dr. J. F. Borg of St. Paul, our guest speaker, gave a fine and comprehensive talk on "Arterio- and Arteriolo-sclerosis." From the number of questions asked, there is no doubt that much interest was taken in this important subject.

The Society was quite interested in the proceedings of the Council and the House of Delegates. It was especially interested in the resolution of the Hennepin County Surgical Society, and the report of Dr. O. E. Locken of Crookston.

During the short existence of our County Committee on Public Health Relations decided results have been produced. Contact with P. T. A. is becoming more and more satisfactory; the 4-H Club is fine and owes its success to the enthusiastic support given us by Mr. A. Sjewall. Through him our Committee has been able to make arrangements for a Health Booth at the coming County Fair, with doctors and a nurse in attendance to explain preventive measures as known and practiced today. Charts and posters will also be used with attractive decorations to draw the attention of Fair visitors. We owe Mrs. P. F. Murphy, Secretary of the Washington County Public Health Association, who is our staunch supporter, a great deal for her valuable help in making these contacts.

As far as practical, we are going to apply the tuberculin test (Mantoux) to school children in the eighth grade and first year High School, some time this summer. We are also trying to make arrangements for the examination of pre-school children and toxin-antitoxin tests. This seems to me to be a pretty fair beginning.

E. SYDNEY BOLEYN, M.D., *Secretary.*

OLD TUBERCULIN IN THE TREATMENT OF TUBERCULOSIS

Koch reported tuberculin to the profession in 1890, and it was hailed as a specific remedy; unfortunately, it was administered in a somewhat reckless way by inexperienced clinicians, and the disadvantages soon resulted in widespread condemnation. Tuberculin is not a selective curative remedy in the treatment of tuberculosis. It is not a specific. It should not be used by general practitioners in routine office practice, but by specialists in the sanatorium or home where there is careful clinical supervision of the patients. (Jour. A. M. A., May 16, 1931, p. 1720.)

WOMEN'S AUXILIARY

Minnesota State Medical Association

President—Mrs. S. S. Hesselgrave, St. Paul
Chairman Press and Publicity—Mrs. E. A. Meyerding, St. Paul
Editor—Mrs. A. A. Passer, Olivia

PRESIDENTS OF THE WOMEN'S AUXILIARY TO THE COUNTY MEDICAL SOCIETIES, 1931

Blue Earth County	Mrs. A. E. Sohmer, Mankato
Camp Release	Mrs. J. S. Kilbride, Canby
Hennepin County	Mrs. Martin Nordland, Robbinsdale
McLeod County	Mrs. Thos. J. Trutna, Silver Lake
Meeker County	Mrs. A. W. Robertson, Litchfield
Mower County	Mrs. A. W. Allen, Austin
Nicollet-Le Sueur	Mrs. Joseph O. McKeon, Montgomery
Olmsted County	Mrs. M. S. Henderson, Rochester
Park Region	Mrs. C. O. Estrem, Fergus Falls
Ramsey County	Mrs. W. H. Hengstler, 1120 Lincoln Ave., St. Paul
Red River Valley	Mrs. B. C. Bernard, Thief River Falls
Redwood-Brown County	Mrs. Wm. A. Meierding, New Ulm
Rice County	Mrs. M. L. Mayland, Faribault
Scott-Carver County	Mrs. B. H. Simons, Chaska
Stearns-Benton	Mrs. Werner Hemstead, St. Cloud
Steele County	Mrs. A. B. Hart, Sr., Owatonna
St. Louis County	Mrs. F. N. Knapp, 327 Kenilworth Ave., Duluth
Southwestern Minn.	Mrs. L. Sogge, Windom
West Central	Mrs. Chas. Bolsta, Ortonville
Washington County	Mrs. J. W. Stuhr, Stilwater
Wright County	Mrs. John Catlin, Buffalo

The Women's Auxiliary has gained ten new auxiliaries during the past year under the direction of the organization chairman, Mrs. James Blake. Minnesota now has 23 auxiliariés, comprising 54 counties; 267 new members this year; 937 paid members, state and national; 78 paid in state; 1,024 listed as members (46 delin-uent). Lyon-Lincoln Medical Society has authorized n Auxiliary to be organized at a meeting called for une 29 at Tracy.

CAMP RELEASE AUXILIARY

Officers of the Camp Release Auxiliary met in executive session at Granite Falls, May 26, after a picnic unch. Mrs. J. S. Kilbride, Canby, president of the uxiliary, presided. She was assisted by the members f her board: Mrs. C. M. Johnson, Dawson, vice presi-ent; Mrs. George H. Mesker, Olivia, second vice presi-ent; Mrs. R. C. Adams, Bird Island, secretary; Mrs. . G. Smith, Montevideo, treasurer. It was voted to ave a joint picnic with Camp Release Medical Society t Green Lake in June. The following committees were ppointed: Membership—Mrs. R. C. Adams, Mrs. H. ohnson, Mrs. R. Billings; Entertainment—Mrs. George Mesker, Mrs. L. G. Smith, Mrs. L. J. Holmberg; Pub-city—Mrs. A. A. Passer; Legislative—Dr. Kathleen ordan; Public Health—Mrs. M. A. Burns; Nominating—Mrs. A. G. Sanderson; Mrs. M. S. Nelson, Mrs. Dordal.

RAMSEY COUNTY AUXILIARY

Ramsey County Auxiliary held its annual picnic and nnual business meeting and election of officers on Mon-ay, May 25, at the summer home of Mrs. Henry N. lein, Turtle Lake. Reports of officers and chairmen were given, showing an active year. Mrs. Hesselgrave, state president, was guest of honor and thanked the members of her own Auxiliary for their splendid cooperation with the state and national auxiliaries throughout the past year. The election resulted as follows: Mrs. W. H. Hengstler, president; Mrs. Karl Dedolph, vice president; Mrs. O. W. Holcomb, second vice president; Mrs. Harry Ghent, recording secretary; Mrs. C. C. Bell, corresponding secretary; Mrs. Donald Bacon, treasurer; Mrs. E. M. Hammes, auditor.

REDWOOD-BROWN AUXILIARY

At a meeting held in New Ulm, May 19, the Redwood-Brown Auxiliary was organized and the following officers were elected: Mrs. Wm. A. Meierding, New Ulm, president; Mrs. A. P. Goblirsch, Sleepy Eye, vice president; Mrs. Albert Fritsche, New Ulm, secretary-treasurer. The members of the new auxiliary and the doctors held a joint banquet and it was observed that the meeting was unusually well attended and due credit was given to the auxiliary. Fifty-four were present at the banquet.

RICE COUNTY AUXILIARY

The Women's Auxiliary to the Rice County Medical Society met on May 13 at the home of Mrs. C. A. Traeger of Faribault. Mrs. P. F. Meyers, chairman of the nominating committee, presented names for election of officers. The following were elected for the coming year: Mrs. M. L. Mayland, president; Mrs. Warren Wilson, vice president; Mrs. A. L. Haynes, secretary; Mrs. Orin Thorson, treasurer. A report of the state meeting held in Minneapolis in May was given by Mrs. A. M. Hanson. A layette was furnished for the Northfield hospital. Refreshments were served by the hostess and the meeting adjourned until October. Mrs. C. J. Plonske and Mrs. M. L. Mayland will attend the National Auxiliary meeting in Philadelphia in June.

SOUTHWESTERN MEDICAL AUXILIARY

A Women's Auxiliary to the Southwestern Medical Society was organized on May 11 in Luverne. The meeting was called for 8 p. m. at the home of Mrs. C. L. Sherman. Mrs. S. S. Hesselgrave, St. Paul, and Mrs. James Blake, Hopkins, were present and aided in perfecting the organization of this new group. The following officers were elected: President, Mrs. L. Sogge, Windom; Vice President, Mrs. E. W. Arnold, Luverne; Secretary-Treasurer, Mrs. E. A. Kilbride, Worthington.

STEARNS-BENTON AUXILIARY

The annual meeting of the Auxiliary was held in the Art Shop tea room on Tuesday, May 12, in St. Cloud. One o'clock luncheon was served to the sixteen members present. Annual reports of the officers were read and accepted. Mrs. J. D. Kohler of St. Joseph was elected second vice president; Mrs. J. J. Gelz, corresponding secretary; and Mrs. Jennie Havorka, treasurer. On Saturday evening, May 16, the Stearns-Benton Medical Society entertained the members and their wives of Upper Mississippi and Wright county societies in the community room of the Court House in St. Cloud. The moving pictures of Surgical Technic which had been presented at the state convention in Minneapolis in May were shown. The Auxiliary served lunch after the program. Tuesday, May 26, Mrs. J. C. Buscher of St. Cloud entertained the Auxiliary Bridge club at her home. Honors were won by Mrs. H. B. Clark and Mrs. J. E. Dwyer.

STEELE COUNTY AUXILIARY

The Steele County Medical Society held a special meeting and banquet at the Owatonna Hotel. Dr. L. R. Critchfield of St. Paul was the guest of honor. Other guests included Mrs. Critchfield, Miss Agnes Melbostad, Miss Emma Leach, and the wives of the members of the Steele County Society. At the close of the banquet, the ladies adjourned to the parlors, where the Women's Auxiliary of the Steele County Medical Society was formed with the following officers elected: Mrs. A. B. Hart, Sr., president; Mrs. A. B. Stewart, vice president; Mrs. E. W. Senn, secretary; Mrs. L. V. Berghs, treasurer. This auxiliary plans to affiliate with the state and national auxiliaries at a meeting June 19. For the present meetings will be held on the third Friday of each month at the Owatonna City Hospital.

WASHINGTON COUNTY AUXILIARY

The annual meeting of the auxiliary was held at the home of Mrs. F. G. Landeen on Tuesday afternoon, June 2. Miss Christine Strom, superintendent of Lakeview Memorial Hospital, gave a talk on "A Résumé of a Student in Our School of Nursing." The Women's Auxiliary and the Washington County Medical Society will hold a joint picnic July 9, at the home of Dr. and Mrs. Henry Van Meier on Lake St. Croix. New officers for the ensuing year were elected as follows: Mrs. Wilfred Hewson, president; Mrs. E. V. Strand, vice president; Mrs. R. J. Josewski, secretary and treasurer.

SCIENCE AND THE ADVERTISER

Printers' Ink, a journal for advertisers, is anxious to establish a "Forget Scientists Week": "Perhaps you have been so foolish as to think that scientists worked at the business of science. Not so. They test cigarettes, tell frightened mothers about breakfast foods, warn young men against the dangers of something that usually ends with -osis. Now and then to be sure they make an epoch-making discovery which will bring about an astounding revolution in the manufacture of nine-count, full-fashioned galoshes. In short, they are scientists of the advertising pages." *Printers' Ink* recognizes the dismay that has been aroused in scientists generally by the exploitation of pseudoscience in advertising. It ridicules those who are now preparing copy for advertisements in modern periodicals because they are so utterly lacking in originality. Advertising in the periodicals of the United States has gone to lengths that have opened it to ridicule and censure. (Jour. A. M. A., May 23, 1931, p. 1799.)

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of May 21, 1931

The regular monthly meeting of the Minneapolis Surgical Society was held in the Lounge on the 20th floor of the Medical Arts Building, on Thursday evening, May 21, having been postponed on account of the State meeting. The meeting was called to order by the President, Dr. A. T. Mann, at 8 p. m. There were 26 members and visitors present.

The scientific program consisted of the following:

Dr. A. T. Mann stated he would like to present a specimen showing dry gangrene of the right hand. The patient was a woman 77 years of age and her history ran back about a year ago when a medical man was called to see her on account of heart trouble. He saw her about once a week for a while, then about December he was called over in a hurry one day and found her in delirium with a bad pulse and a painful area just above the elbow in the upper arm. The forearm was moderately swollen and an induration could be felt running from the wrist toward the elbow along the region of the ulnar artery. The hand the next day was blue and the fingers became black the next day; the thumb, the following day. Her delirium continued for about two weeks. She had a temperature of 102° and when the physician first saw her he thought she had "flu." He thought she was going to die. The line of demarcation soon developed on the line in which it shows now, on the thumb, most of the palm and up the little finger on the outside, all of the fingers and some of the back of the hand. In going over the history carefully, Dr. Mann said he could get no history of a sudden pain. An embolus will practically always give a sudden sharp pain when first arrested, and a thrombus acts just about the same way without the pain. It may be that there was a small embolus, partly occluding, in the region at or above the bifurcation of the main brachial artery just above the elbow followed by an occluding thrombosis.

Dr. Mann said he felt that gangrene of the hand is so rare that the members would be interested in seeing this specimen. As stated, the patient is 77 years old. Both feet are warm. It is now five days since he removed the hand and she has been sitting up in a chair since the third day. The dressing shows a nice warm line and no necrosis. When the amputation was done there were no vessels to tie; no vessels spurted and he thought he might have to amputate higher in the arm. He finally got hold of the ulnar artery, pulled it down and picked at it a little. It bled just a very little and so it was tied, but he thought he could have done the whole operation without tying a single vessel.

DISCUSSION

Dr. E. A. Regnier said that ordinarily one would not expect gangrene in the hand from an embolus of the brachial artery, and one would probably have to explain the presence of gangrene in this case on an arteriosclerotic basis. He had seen a man 78 years of age who had an arteriosclerotic gangrene of the little finger.

Dr. Mann said the patient showed no evidence of this except that the vessels showed obliteration. As soon as she was able to be taken to the X-ray room afterwards, films were taken of all extremities. These showed a moderate atheroma of the arteries in both legs and in both arms, with slight areas of calcareous material.

Dr. J. F. Corbett recalled one case of gangrene of the hand that was, in part at least if not wholly, due to cervical rib. He wondered if there might be something like that in Dr. Mann's case.

Dr. Robert P. Caron read his thesis entitled "Intra-abdominal Local Anesthesia" and showed lantern slides demonstrating the method.

DISCUSSION

Dr. S. R. Maxeiner felt that Dr. Caron's excellent paper should not go entirely without discussion. Dr. Caron's observations were particularly interesting to him and he believed now that, with the popularity of spinal anesthesia, local anesthesia forms an excellent addition to the armamentarium of the surgeon, particularly in those cases in which the anesthesia is not sufficiently lengthy. He stated that at Fort Snelling they had had about 40 operations on the stomach under spinal anesthesia. Many of the spinal anesthesias had not lasted long enough for them to accomplish complete gastric resection, although it is usually adequate for a pyloroplasty or a gastroenterostomy. However, they have been injecting the abdominal wall immediately on opening the abdomen and when the viscera are exposed the splanchnic nerves supplying the organ to be attacked have been blocked. Turning up the colon and omentum, he has deposited novocain near the ligament of Treitz and by blocking the gastrohepatic omentum he has secured profound splanchnic anesthesia which has allowed total gastrectomy without spinal, but when performed conconmitantly with spinal neither the patient nor the operator realizes when the spinal anesthesia is lost. In the performance of Polya operations for recurrent duodenal and gastrojejunal ulcers, anesthesia has been complete at the end of two and a half hours. Dr. Maxeiner felt that in the aged, the toxic, and in those cases constituting the substandard risk, local anesthesia should surely constitute a part of the armamentarium of the operator. He said that he had done the upper stage of the Coffey operation by blocking beneath the pelvic brim, which anesthetized all of the sympathetics to the entire pelvis as demonstrated by Dr. Caron's slides. He usually turned the colon to the midline and infiltrated the pelvic brim and then, turning the colon to the other side, completed the injection entirely around the pelvis. By this anesthesia, the upper stage of the Coffey operation may be done as completely as with general anesthesia. Dr. Maxeiner was of the opinion that all surgeons should be able to block the sympathetics within the abdomen, most failures being due to the fact that surgeons will not learn the fundamentals and do not use the method sufficiently often to remain proficient. The more refined surgical technic demanded by the use of local and spinal anesthesia is just as efficient in the prevention of shock and trauma when spinal or general anesthesia are used.

Dr. Maxeiner expressed congratulations to Dr. Caron upon his excellent paper.

Dr. E. A. Regnier felt that the Society was to be complimented in having Dr. Caron's paper so splendidly presented. After seeing the slides and hearing the paper, Dr. Regnier felt that the biggest thing which Dr. Caron had brought out was the practicability of intra-abdominal local anesthesia, and the focusing of attention on its indications. He stated it was particularly indicated in the aged and debilitated people who were poor risks for general anesthesia and likewise for spinal anesthesia. Dr. Regnier mentioned a recent operation which he had done on a patient 67 years old, with a carcinoma of the pylorus in which a subtotal gastric resection was done entirely under local anesthesia, with a maximum pulse rate of 78 while the patient was on the operating table. Without local anesthesia it would have been difficult to manage a case of this kind. He felt that where most surgeons fail in the use of local anesthesia is in taking fifteen to twenty minutes to obtain splanchnic anesthesia after the abdomen is opened. He feels that he cannot sacrifice this time and hastens to use general anesthesia, thereby failing in his objective.

Dr. Caron, in closing, said he wished to emphasize one point, i.e., in the establishment of splanchnic anesthesia, the perivascular injection is of paramount importance. In other words, if the injection is made right next to the mesenteric blood vessels the anesthesia is more certain.

In the Annual Prize Essay Contest offered by the Minneapolis Surgical Society, the judges had awarded the prize to Mr. Theodore C. Erickson, student in the University of Minnesota Medical School. According to the terms of the contest, the winning essay must be read before a meeting of the Society.

Mr. Theodore C. Erickson read his assay entitled "The Histologic Grading of Squamous-Cell Carcinoma of the Lip," and charts were shown.

DISCUSSION

Dr. J. M. Hayes said he was very much pleased to have Mr. Erickson present this subject. About eleven years ago he had gone over some of these cases and was much impressed with the way in which Dr. Broders gave his prognosis in each case with nothing to guide him but the dusty slides he had taken from the shelves. The records in the histories proved that he was correct in his prognosis in the great majority of the cases. Other pathologists apparently have not been able to follow Broders' method. The essayist has shown that with his limited experience he has done very well with this method of grading. Dr. Bloodgood has stated that he believed this was a decided advancement in the recent studies of malignancy. No doubt both the surgeon and clinician would feel greatly aided by a prognosis as definite as this.

Dr. James Johnson thought this was a very splendid piece of work and congratulated the essayist. He felt it was through this type of work that progress would be made in the handling of carcinoma. He wished, however, to leave one thought with the men, one which had come entirely from clinical experience, and that is that this type of grading had not been safe enough to justify minimizing the operation in any way in the treatment of carcinoma. He felt that, regardless of what the type might be, one still has to rely upon a thorough removal of the growth and the adjacent glands. Dr. Johnson said undoubtedly in time pathology would reach a stage where this type of grading would be more accurate, but at the present time, from the standpoint of treatment, all carcinomas should be given a thorough radical removal.

Dr. Mann said, of course one can never tell when there are secondaries in the glands, and personally he felt that whenever an operation is done on the lip a dissection of the neck should be done also.

Mr. Erickson, in closing, said, in regard to the correlation between the type of operation and the postoperative history in the case, that he had just started working on that phase of the problem and was sorry he had no results to report at this time. He hoped to have some in the next two months. He believed there was really no justification for doing just a local excision on the Grade I group as yet, because most men could not grade these as well as Dr. Broders does. At the Mayo Clinic at least 80 per cent have had excision of the local lymph nodes. Brewer in his work showed the relation between the percentage of five-year cures and the type of operation. He found that where there was no glandular involvement demonstrable, local excision alone gave 66 per cent of five-year cures, while local excision combined with block dissection of the neck gave 92 per cent of five-year cures.

Mr. Erickson said he was very much impressed by the way in which Dr. Broders could grade these carcinomas. Many others have tried other methods of grading which have differed somewhat from Broders' but he thought none of the other methods have shown the merit which Dr. Broders' has shown. Hueper of Chicago has a method of grading, using 20 different items, such as separate characteristics of the cells, but this seems too complicated for practical use.

Dr. O'Brien of the University Hospital, in a survey of the literature on carcinomas of the bladder, concluded that Broders' method of grading gives just as good results in prognosis as clinical judgment based on both clinical findings and the usual pathological data.

Dr. R. R. Cranmer read a paper on "Spinal Anesthesia" and slides of numerous charts were shown.

DISCUSSION

Dr. Martin Nordlund said there were two points with reference to spinal anesthesia which might be of interest and which he would like to have Dr. Cranmer discuss. First, nothing was said in the discussion with reference to the amount of drug which should be administered and particularly what the factors were which would determine this amount. He called attention to Dr. Lunde's method of using 1 mg. for each pound of weight of the patient. Second, he thought it important to consider the cause and the treatment of the nausea which frequently occurs during the operative procedure, following the administration of spinal anesthesia. He called attention to a recent talk by Dr. Wright of the Pharmacology Department of the University of Minnesota before the Hennepin County Medical Society, with reference to stimulants. Dr. Wright emphasized the value of Alpha-lobelin and Metrazol as respiratory stimulants. Dr. Wright stated that he believed these drugs would be of benefit for the nausea thus developed.

Dr. Nordland said in his experience with spinal anesthesia, he believed that these drugs were very effective in preventing the nausea.

Dr. Daniel Bessesen (by invitation) said he would like to add a few points to the discussion. During the last decade a tremendous amount of work had been done on all types of anesthesia and since this work had grown it seemed to him the indications and contraindications had been greatly altered. He felt that the anesthetic may be selected for the individual case and the individual type. Some individuals should be put to sleep. Crile and his associates wish to put most of their goiter cases to sleep. Dr. Bessesen thought blocking should be done in any case where there is a desperate risk. Spinal anesthesia has a great field and the indications and contraindications which Dr. Cranmer has given represent the last work on that subject. He himself had been somewhat surprised at the number of surgeons who do not consider spinal anesthesia contraindicated in peritonitis. He always preferred the Fowler position but these surgeons do not seem to fear using spinal in their cases of peritonitis, after which they are placed in the Trendelenburg position for three hours and then are kept in the flat position for 24 hours without apparent bad results.

Dr. Bessesen said one might wonder if the drop in blood pressure would produce embolus formation. He had not noticed any reported in the literature, and perhaps none had been made by the men using spinal anesthesia.

In regard to the question of headache, Dr. Bessesen believed this is brought on by some change in intracranial pressure. An increase of intracranial pressure may be treated by 6 oz. of magnesium sulphate in the rectum. This may be administered intravenously using 2 c.c. of 50 per cent magnesium sulphate diluted to about a 20 per cent solution. If the lowering of pressure is not successful, the introduction of pituitrin may be found successful.

Dr. Bessesen said it seemed to him as though the deaths from spinal anesthesia have been considered as a mysterious matter. About the only thing one can base this on is the change in blood pressure. If the blood pressure is found to be reduced to a dangerous level then one must rely entirely on stimulating drugs such as ephedrin or pituitrin, or the Trendelenburg position, or the introduction of fluid into the vein; the Trendelenburg and fluids being the more valuable. In cases of paralysis of the ileum, spinal anesthesia has been successful in relieving the ileus.

He felt the general impression was against the use of spinal in cesarean section, for the reason that in these operations one might anticipate more hemorrhage, which might result in a drop in blood pressure.

In regard to nausea, altering the level of the table will sometimes relieve this; also the use of 5 per cent carbon dioxide as advocated by Yandel Henderson.

Dr. Bessesen said the use of spinal anesthesia is fairly well-established in the field of anesthesia.

Dr. H. O. McPheeters said he was interested in what Dr. Cranmer said about spinal in cesarean section. He himself had been so much pleased with the results of spinal anesthesia in obstetrics. So far he had had only nine cases in which he had used it and in some of them it had worked beautifully. He had used "gravocaine" and with that the patient is put in the Fowler position. The directions on the box are to give the spinal with the patient upright and with the feet over the edge of the bed, and wait three or four minutes; but in actual use he had found it better to wait for ten to twelve minutes. The uterine contractions will be scarcely diminished and if they are violent or there is one tremendous pain right after another the labor will continue right on and the woman will hardly know she is having the baby. The relaxation of the perineum is ideal. Dr. McPheeters said he really believed that spinal is going to be the ideal anesthesia for obstetrics.

Dr. Mann asked about hemorrhage in these cases.

Dr. Webb stated that he had an interesting experience with spinal anesthesia day before yesterday. He operated on a patient who had a perforated ulcer of the duodenum. The preoperative diagnosis was questionable; the signs were rather of an acute appendix or gallbladder. The patient had, however, a previous history of ulcer of the stomach. Before he opened the peritoneum he filled the incision with water as had been his custom for many years when perforation is suspected. If there is air in the cavity it will come up through the water and one can know that he must search for perforation of the gastrointestinal tract.

When the peritoneum was opened, no air bubbled through the water in the wound but the water merely went into the abdominal cavity due to the negative pressure produced by the spinal anesthesia and as a result he learned that this test was no longer useful when spinal anesthesia is used. The appendix was found to be acutely inflamed, surrounded with turbid fluid and with fibrin on its tip and the pathological report was "acute appendix." Because, however, of evidence of inflammation about the gallbladder, the incision was extended upward and the perforated ulcer of the duodenum was found and closed in the usual manner and the wound was closed without drainage.

Another point in connection with spinal anesthesia which Dr. Webb wished to bring out is that when using spinal the surgeon expects to get through in a reasonable length of time and he should be able to rely on the observations of the anesthetist. He was of the opinion that the anesthetists of this city do not know as much as they might about spinal anesthesia and experience in observing it does not accumulate. He advocated adoption of a uniform blank through the city for the anesthetists' use so that they will be of more assistance to the surgeons in observing the cases while they are giving their attention to the surgery.

Dr. McPheeters replied there had been no hemorrhage except in one case which he packed to be on the safe side. But he had had hemorrhage in other cases of the same type where he had used no anesthetic at all.

Dr. Mann stated that in looking over some of his own cases, while he had not done very many (he did his first case before the War), he had had no fatalities, but had sometimes been worried. In reviewing the literature, he had found that there have been a few cases of paraplegia following spinal anesthesia. There was one case reported in Europe in which the paraplegia was still present at the time the patient was discharged from the hospital. There was another case in which there was paraplegia which later cleared up. There was retention of urine and in one case the catheter had to be used over one year before the patient recovered his own power again. One man in Paris reported two cases of his own of ocular paresis and collected 84 others. Dr. Mann said one might possibly expect ocular paralysis where a high anesthetic was used but 26 of the cases of ocular paralysis were reported from a clinic in which over 1,500 spinals had been done and in which one of the rules laid down was never to operate above the diaphragm and always to give a low injection.

Regarding the fixation of the novocaine, Dr. Mann said that putting novocaine into spinal fluid makes a solution more heavy than when there was spinal fluid alone, and that is just what most of the spinal anesthesias are—novocaine crystals dissolved in spinal fluid. Then if the patient is turned on his back and in about 5 minutes or so the table is tipped with the patient's head down, that novocaine must be more or less fixed by that time so that it cannot travel, otherwise there is no limit as to where it might run to.

In one clinic there had been 8 deaths in about 11,000 spinal anesthesias. Four of the deaths were due to heart failure within a few minutes, and the other 4 with irritative lesions of ordinary spinal puncture, irritation of the meninges giving rise to headache, pain in the back and meningeal symptoms. Those occurred just a few days later and were attributed to the spinal anesthetic definitely by the man doing them.

Then there is the question of resuscitation. When there is syncope and heart failure, what are you going to do? Then respiration stops too. There has been some work done with injecting adrenalin directly into the heart, with resuscitation of the heart and return of the pulse. Dr. Mann also called attention to another very interesting report from Paris, of the use of caffein after failure with adrenalin injected directly into the heart. In this case they had injected camphorated oil and caffein. They injected the heart with adrenalin and the needle moved a little but the respiration did not come back so they turned the patient over and injected caffein, 50 ctg., into the spinal canal. Their statement was that respiration came back almost at once, and almost immediately with it the heart action. But the injection was cervicodorsal and they had used this region also for their original spinal analgesia.

Dr. Mann said one more thing in the reports interested him very much and that was that Leclerc in Dijon had made a study of cerebrospinal fluid one, two, three, four and six days after spinal injection. He studied 31 cases and found in 9 of them there was an increase in the lymphocytes without much increase in the polymorphonuclears except in one case. In 11 there was increase of albumin one and two days after, and in 15 cases he reported the sugar content was increased. Leclerc went on to say there could be a very definite relationship established between the headaches and the lymphocytosis; and they felt the headaches could be very definitely associated with the conditions in which there was an associated lymphocytosis. Of course there could be other causes too. They found no association in the cases with increase of albumen, and no association with increase in the sugar.

Dr. Webb said one hears a good deal about the "bad risk patients" in this connection, and he wondered how many of the patients are really bad risks. He thought most of them should be good risks unless the surgeon has a reputation for operation on bad risks. He felt a good risk patient deserved the anesthetic which will best enable the surgeon to work for the good of the operation to the patient. Occasionally the "good risk" patient dies from some effect of operation which could have been made easier and he thought in that respect spinal anesthesia deserved a good deal of regard. He did not think that the good risk patient should any longer be advocated as material for keeping up one's technic in use of local anesthesia.

Dr. M. J. Lynch said he would like to know what percentage of the members present, if they had to have a herniotomy, would prefer spinal to local.

Dr. Mann asked for a vote as to the type of anesthesia each would desire in herniotomy on themselves:

6 voted for spinal
16 voted for local
0 voted for ethylene
0 voted for nitrous oxide
1 voted for ether

For removal of the gallbladder:

5 voted for local
13 voted for spinal
3 voted for ether
0 voted for gas—nitrous oxide
0 voted for ethylene

Many did not vote at all.

Dr. Cranmer, replying to Dr. Nordland's question about the dosage of the crystals, said they had been using 150 mg. in the average adult in all operations below the umbilicus, and in children this is reduced to 75 mg., 200 mg. being used in operations in the upper abdomen. Until the first of this year they had not expanded the solution at all and he felt that their results had been just as good; he could not see that this added anything to the procedure. Of course one can get a higher anesthesia with expansion of the anesthetic solution. This expansion is called barbotage.

Dr. Cranmer believed the rate of injection is an important item, and they had tried injecting the solution ½ c.c. a second. He said the height of the anesthesia depends on the amount of solution the crystals are dissolved in, and the speed of injection. The injection is made somewhere between the first and fourth lumbar interspaces, most of them in the third. They had not given ephedrin for a drop in the blood pressure because he thought it is contraindicated. He believed after the spinal injection, when one gets paralysis of the sympathetic nerve supply of the splanchnic vessels, the ephedrin will not affect those blood vessels at all. It reduces the volume of blood in general circulation by its effect on the other blood vessels by forcing more volume of blood into the dilated splanchnic vessels and renders the possibility of cerebral anemia even greater. He said one man had tried out various procedures for combating the drop in blood pressure, and it was reported in the last issue of the *American Journal of Surgery*. This man found that the intravenous injection of normal salt solution is the most reliable method of combating the blood pressure fall.

As Dr. Bessesen has said, there has been considerable mystery about the deaths in spinal anesthesia. It is known, however, that in the larger clinics in the country the mortality rate has been reduced to almost nothing. Wayne Babcock has used it in 1,500 cases with no anesthetic mortality. Dr. Cranmer said he understood there had been some deaths in Minneapolis from spinal anesthesia but he had not talked with any of the men about the cases. One patient, he understood, went through the operation all right and was sent down on the cart with the head lowered. The patient was then put in a Fowler bed and the head of the bed *raised.* The resident came along and saw the patient's condition and endeavored to lower the head of the bed but the crank did not fit and he was unable to get the head down soon enough and the patient passed out. Dr. Cranmer felt that one could not blame the spinal anesthetic for that death, and thought it was just a mistake in proper handling. He felt that it is just as important for one to know the proper handling of the patient as it is to know how much anesthetic to use. The cause of death is cerebral anemia. It was formerly thought that it was due to the fact that the solution injected into the spinal canal gravitated through the spinal fluid and paralyzed the medullary centers. The work of Koster & Kashmann reported in S. G. & O. about two years ago proves that could not be the cause of death. They applied cotton saturated in 10 per cent novocaine to the medulla of animals without causing death.

Dr. Cranmer said he wished to add that the preparation of this paper was in part by Dr. Carl Henrikson, a Fellow in Surgery at the University, who had worked with him in going over the histories of the patients and making the graphs, etc. The paper was presented jointly by Dr. Henrikson and Dr. Cranmer.

Dr. Arthur T. Mann, retiring President, then read his presidential address, entitled "A Short Address on the Passing Year," as follows:

PRESIDENT'S ADDRESS

It is fitting that as President of the Minneapolis Surgical Society I should say a few words now at the close of our interesting year.

I appreciate highly the honor you have conferred upon me in making me your president. It has been an inspiration to have been in close association with such an able body of men as compose this Society; men who are so much in earnest, whose ideals are high and whose accomplishments are steadily increasing. The impetus you have already given to the Society and the work you stand ready to do for it, give promise for a steady growth in its field of usefulness and an enduring increase in its sphere of influence.

Fully aware that the program tonight is a long one, I shall endeavor to confine my remarks and make them as brief as is suitable to the occasion.

Our programs have been full, they have been of high grade and they have been constantly interesting, a fact that has been shown by our inrceasing attendance, by the value and the high tone shown in the discussions. We have had presentations that would have honored any surgical society. They have been varied and they have been constant. There have been given the results of much original work of considerable value, painstaking work, carefully carried through thoughtfully considered and presented in an interesting and attractive form. The moving picture reels and the many lantern slides which have been shown have helped to make the presentations effective. The case reports have been prepared with great care and have added much to the range of the programs.

The material for the programs has been so abundant that it has been impossible to include it all in the programs of the year. So much must go over into the next year that all those who wish for a place on the program may find some difficulty in arranging for it. You should keep this in mind and ask for your places early.

During the present year there has been one evening given over to a clinic and one, our Annual Banquet, with an invited guest of distinction to deliver the surgical address of the year. This seems a good custom to follow.

The clinic, this year, was given at the University Hospital. This clinic, presented by the Surgical Department, with the abundance of the material offered, might well have occupied two evenings. This is the only criticism to offer, for the thirteen speakers on the program had their material well organized and their presentations were admirable.

Our guest speaker, Dr. Clay Ray Murray, of New York, not only made himself felt by giving a brilliant address at the Banquet, but extended his influence widely by giving an address before the Hennepin county Medical Society, another address before the Medical School at the University, and by giving a thoroughly appreciated clinic on "The Modern Treatment of Fractures" to the profession at large, at the Minneapolis General Hospital. The Surgical Society cannot help but be uplifted by bringing here such a man as Dr. Murray.

However, I feel that the usual meetings of the year should be given over to the members of the Society. Those who prepare papers gain more benefit and the Society will have a more substantial growth than in any other way.

To touch some of the other high spots of the year: We have considered the purchase of a lantern of our own and have rejected the idea as we can freely use the lantern here. But we have purchased one of the best movable screens on the market so we can show our pictures anywhere. The transactions of the Society are printed regularly in excellent form in the Medical Journals. And what seems to me to be one of our most important undertakings is in the hands of a committee earnestly working on plans whereby the difficulties and the differences which arise in the settlement of industrial cases and accident cases may be smoothed out and the work of the State Industrial Commission made more equitable for the doctors who are concerned in the care of these cases.

Before closing this brief address, I wish to point out that we are accomplishing one of the main reasons for which this Society exists, one without which it would fail to justify its continuance. And that is the promotion of good fellowship among its members, a better understanding of the surgeons of this city, among whom we work. Nothing can accomplish this so well as the constant association with one another, giving birth as it does to a better understanding of the many fine qualities which these men possess, their earnestness, their high ideals, their right-mindedness. I know of no finer men, in any city, anywhere, than are to be found among the members of this Society.

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

REFINED ANTIPNEUMOCOCCUS SERUM

Since the discovery of the etiologic relationship of the pneumococcus to pneumonia, the search for an effective antipneumococcus serum has continued unabated. Little progress was made in this direction until 1913, when the biologic classification of pneumococci by Dochez and Gillespie provided a rational basis for modern serum therapy in this disease. Reports on the use of refined and concentrated serum preparations bring evidence showing that a considerable reduction in the mortality rate of type I pneumonia is secured by the use of these preparations. Experiments with the type II pneumonia and particularly types III and IV were not favorable to the use of preparations representing these types. In conformity with the evidence, the Council on Pharmacy and Chemistry accepts antipneumococcus serum representing type I but does not accept serums representing other types or mixtures of all types, holding that type I serum alone is worthy of clinical trial. (Jour. A. M. A., May 2, 1931, p. 1505.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg.
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

CHRONIC MAXILLARY SINUSITIS: Walter Stevenson, Quincy, Illinois (Arch. of Otolaryngology, No. 4, Vol. 13, April, 1931). This comprehensive article deals in detail with 192 cases that came to operation, and explodes the old adage, "Once a sinus always a sinus."

The chief complaints of patients in order of frequency were as follows:

1. Recurrent head colds—102
2. Nasal discharge and post-nasal dropping—63
3. Pain, usually in maxillary region—30
   Five complained of frontal headache.

Toothache was a common complaint. Several patients had no head symptoms, but had been referred by internists searching for focal infection. Sixteen per cent (thirty-two cases) had originated following dental extractions:

Under diagnosis, nausellumination, X-ray and lavage are discussed. The author thinks the first as valuable as the second. Lavage should not be considered negative unless the washings have been proved so by microscopic examination.

Under treatment the author shows that none of the chronic cases were permanently benefited by puncture and lavage: The Krause (intra-nasal window) was done in all but twenty-two cases. In the remainder a radical operation was needed (Caldwell-Luc). This number (twenty-two) includes five cases which had had the Krause operation done previously, but without a satisfactory result.

The author is not in favor of postoperative washings of the cavity. Shrinking, mild suction and attention to exuberant granulations with silver, gives satisfactory results.

RESULTS

Complete recovery occurred in all but nine cases, which were lost to observation. Focal disease, with the exception of five asthmatics, was relieved or cured.

Details are given concerning operative technic, pathological findings, both gross and microscopic, and a special section in regard to nasal polyps. Several case reports follow. The entire article impresses one as having been written by a man who is absolutely sure of his ground, and with the courage to apply fundamental surgical principles to sinus surgery. Apparently his results justify his methods. The author's summary is given verbatim.

SUMMARY

1. Intranasal surgical intervention is the operation of choice for a primary attack in all chronic infections of the maxillary sinus. Ninety-four and two-tenths per cent of my patients recovered completely following these procedures.

2. The Caldwell-Luc operation has proved satisfactory as a radical operative measure.

3. Transillumination and the roentgen rays are equally effective as diagnostic aids.

4. Except in selected cases, dry treatment is effective in the after-care, and, in my opinion, is the better procedure.

5. Contrary to popular lay opinion, operative treatment for maxillary sinusitis is justified by the results.

6. Focal disease seems to follow this type of infection.

7. In the author's opinion, nasal polyps are associated with maxillary disease more often than with infection of any other sinus, and careful investigation of the maxillary sinus should be made in every case of apparent hyperplastic ethmoiditis. Conservative surgical intervention usually suffices in these cases.

8. Sewall's method of estimating the cytologic content of the maxillary antrum seems to be a distinct advance in the diagnosis of this disease.

9. Injudicious curettement of the sockets of the teeth opening into the maxillary sinus is to be condemned. Curettement should always be followed by suitable surgical intervention to close the wound.

M. W. Wheeler, M.D.

INTRACAPSULAR CATARACT EXTRACTION: Leo F. McAndrews, M.D., Philadelphia (Arch. of Ophthal., Jan., 1931, Vol. 5, No. 1). Three methods of operation are considered (1) Smith, (2) Kalt forceps, (3) Barraquer suction.

Each method is considered in detail with statistics on complications given very fully.

The author is of the opinion that the Smith operation is losing ground and gives the chief disadvantage as frequent loss of vitreous and drawn-up pupil. Advantages given are those of freedom from iritis, lack of secondary operation, and no limit as to type or maturity of cataract.

The Barraquer operation demands special training and experience and is not popular in this country. It can be regarded as being in the experimental stage.

The Kalt forceps method seems to be the most popular method. The originator tears away a large piece of capsule, but some men remove lens intact. An objection is the pull on the ciliary body.

A review of the recent Congress in Amsterdam gives the "modern cataract operation" as being extraction in the capsule with peripheral iridectomy and suture of conjunctival flap.

This article is voluminous and very well written. If there could be any criticism it would be that conclusions on comparative popularity of various operations were not based on the opinions of enough men. A comprehensive questionnaire with wide circulation might have brought out different deductions, but nevertheless it is a very worth-while addition to cataract literature.

K. C. Wold, M.D.

A STUDY OF CALCIUM IN RELATION TO CATARACT—REPORT OF RESEARCH. Daniel B. Kirby, Fellow in Ophthalmology (Presession Volume, The American Academy of Ophthalmology and Otolaryngology, Page 89, 1930). Cataract appears in various forms and the causes of each form are undoubtedly different and dependent on a number of conditions. Cataract, however, is frequently associated with tetany and parathyroid deficiency. In tetany there is usually, and in parathyroid deficiency there is always, a disturbance of calcium metabolism. For this reason an attempt was made to determine the relation of calcium metabolism to cataract, and by this means, if possible, to improve the non-surgical treatment.

The steady level of the calcium in the circulating blood is maintained by the action of the secretion of the parathyroid. When the parathyroid secretion is deficient the serum calcium is found to be below normal. The best parathyroid extract for use in treating calcium deficiency of the blood is parathormone, which is prepared by weak acid hydrolysis of the parathyroids of the ox.

Undoubtedly calcium deficiency in cases of infantile tetany is the cause of the cataracts. Increased knowledge regarding the treatment of infantile tetany has led to a great decrease in the number of cataracts due to this condition. In cases of tetany cataract there is a reduction in the serum, aqueous, and lens calcium content. Once the cataract has formed, administration of calcium and parathormone have no influence in removing the opacity from the lens.

In the lens of senile cataract calcium is greatly increased. The calcium deposition results from:

1. Very slow lens tissue death, dependent on nutritional deficiency.
2. Degeneration of the lens protein with lipoid byproducts.
3. Local concentration of calcium by absorption to the large molecules of the lipoids.
4. Deposition of this calcium by change in the pH toward the alkaline side.

Two series of cases of senile cataract were investigated, one at Bellevue Hospital and the other at the Vanderbilt Clinic. In these cases no calcium deficiency was found in the blood. In some of the patients there was a tendency to hypercalcemia.

It was found that there was no necessity for the administration of calcium salts to patients with cataract, as their blood calcium was normal or very close to normal. Likewise there was no indication for administration of parathormone.

Parathormone was administered to three different series of senile cataracts over varying periods. No evidence of absorption or improvement in vision was observed.

James Brusegard.

HERPES AND ALLIED CONDITIONS: Ralph I. Lloyd (Presession Volume, The American Academy of Ophthalmology and Otolaryngology, Page 161, 1930). Hutchinson first described herpes zoster ophthalmicus in 1866. Since this time other symptoms have been added in the literature to his original description of the disease. Some of these symptoms are: pain in the cutaneous area before the skin eruption, corneal ulceration which appears after the skin eruption, increase of temperature and sweating of the skin of the affected area. Microscopic examination of the Gasserian ganglion shows round cell infiltration, small hemorrhages, and degeneration of the nerve fibers running to the first division of the fifth nerve.

Herpes cornea febrilis is milder than the zoster type. The blister of this disease contains a virus that can transmit the disease to the rabbit cornea, while the zoster blister does not do this.

Keratitis dendritica is an eruption of a group of very fine blisters that lose their epithelial covering and link up to form a linear ulcer resembling the small branch of a tree. It frequently follows an attack of influenza.

Keratitis bullosa has also been placed in the herpetic group.

Animal experimentation and exfoliation after apparent healing strongly suggest that traumatic corneal ulcer belongs in this group. In this case the virus is believed to be present in the subconjunctival sac, lying inert until it is carried beneath the epithelium by the injury.

Keratitis punctata superficialis is a very rare disease which belongs to the herpetic group. It consists of minute lesions scattered over the cornea which tend to remain for some time. It never involves the deeper layers and it is frequently associated with bronchial conditions.

Practically every type of herpes shows a lowered sensitivity of the cornea; for this reason it is very important to keep the affected eye constantly bandaged, both indoors and outside. Radiant dry heat, and ½ or 1 per cent solution of optochin locally should be used. In severe types the Shahan thermophore may also be used. In very severe cases of herpes zoster ophthalmicus an application of the X-ray is the only thing that will relieve pain. Most of the severe cases are accompanied by an increase of intra-ocular tension and the X-ray exerts a favorable influence upon the tension.

The after-effects of severe herpes are: deep and wide corneal scarring, anterior or posterior synechiæ, thinning of the iris, change in color of the iris, partial dilatation of the pupil, and sometimes optic nerve atrophy and paralysis of some of the muscles supplied by the third nerve.

The outstanding symptom of all forms of herpes is lowered sensitivity of the cornea, which can be detected by drawing a wisp of cotton across the cornea. Corneal sensation returns slowly. Glaucoma of lesser degrees is frequently found.

Much animal experimentation has been done with the virus of herpes febrilis and the following facts have been discovered about it: the virus does not stain, passes a filter, can be carried from one rabbit to another, is easily killed by heat, and is effective in weak dilutions.

James Brusegard.

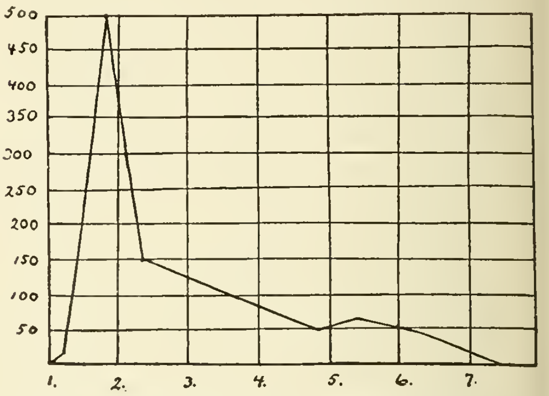
MEDICINE

TUBERCULOSIS ABSTRACTS*

Insomnia is a by-product of our present high-pressure manner of living. Thanks to modern inventions and customs, we are today enabled to enjoy, after a full day's work, another day of recreation which our forebears spent in relaxation or sleep. Normal drowsiness in the evening is fought off in preparation for a night of entertainment. When we finally do retire, sleep will not be successfully wooed. For the tuberculous individual, insomnia is further aggravated by toxemia, discomfort, fear, and worry. Yet rest above all things is necessary for his recovery. W. C. Service outlines the causes, effects, and treatment of insomnia in the April, 1931, American Review of Tuberculosis, from which the following abstracts are derived:

INSOMNIA IN TUBERCULOSIS

Normal sleep is characterized by complete loss of consciousness. The power to make conscious movements wanes first, after which follows the loss of use of the special senses. All voluntary muscles are relaxed, respiration becomes deeper and slower, pulse frequency is lessened, the blood pressure falls, the temperature is lower, secretions are diminished. Of the special senses, hearing is most easily aroused during sleep.



CURVE OF INTENSITY OF SLEEP ACCORDING TO MONNINGHOFF AND PIESBERGEN

The figures along the ordinate show the relative intensity of sleep, measured in milligram-millimeters, expressing the intensity of the sound caused by a falling body necessary to awaken the sleeper. (Modified from Howell's Textbook of Physiology.)

The intensity or depth of sleep increases rapidly during the first two hours and then drops rapidly again, so that by the third hour the sleeper is very near the margin of consciousness, and from that point on the depth of sleep becomes less until awakening occurs.

Insomnia is the inability to secure a sufficiency of normal sleep under favorable conditions. The etiological factors may be grouped under physiological causes, such as pain, dyspnea, cough, pyrexia, gastrointestinal disturbances, toxic states, etc., and psychological causes such as anxiety, neurasthenia, hysteria, confusional states, and compulsion neuroses. True primary insomnia probably never occurs; every complaint of sleeplessness must be investigated for its cause.

TYPES OF INSOMNIA

Five general types of insomnia may be easily recognized, as follows:

1. *Complete absence of sleep.* In tuberculosis, this is most commonly seen during a miliary or acute toxic phase with fever and progressive disease. It is usually of short duration, as complete rest tends to lessen the toxemia, which is usually followed by partial insomnia or even natural sleep.

2. *Sleep on retiring for two or three hours and then wakefulness for the remainder of the night.* This condition is more commonly seen in cases of moderate toxemia. After a profound sleep for about two hours, there is a partial return to near-consciousness. The patient may awaken startled, all senses alert, and without the slightest desire to sleep. After a night of wakefulness, early morning may bring a short sleep from fatigue.

---

*Reprinted from *Tuberculosis Abstracts,* a review for physicians, issued monthly by the National Tuberculosis Association, Vol. IV, No. 7, July, 1931.

3. *Wakefulness for two hours or longer on retiring and finally sleep.* Cases which suffer in this manner are usually the ones who have developed conflicts, especially that of fear. Under the guidance of a sympathetic doctor who understands psychological problems, these patients do extremely well. Fear is an emotion; an emotion is the determining factor of a complex; a complex is an idea plus an emotion. When one complex meets another that is opposed to it, a conflict results. Either a complex or a conflict is, in itself, quite capable of producing insomnia.

4. *Wakefulness on retiring, sleep for two or three hours, and then wakefulness the remainder of the night.* The group so affected represents a combination of the second and third groups. Their inability to sleep on retiring is due to a development of a fear complex or conflict. The inability to stay asleep may be partly due to neuroses, or in part or entirely to the previous damaging effects of the tuberculous toxin.

5. *Dreams: disturbed or restless sleep.* Patients so afflicted usually complain of having a "restless night." Their sleep may be broken by dreams or they may complain of becoming tired in one position and the frequent changing of position may not give them the restful sleep they desire. A heightened irritability of their nervous centers brings their threshold of sleep very near their threshold of consciousness and it consequently takes only the slightest stimulation to arouse them.

EFFECTS OF INSOMNIA

Insomnia affects the body as a whole. After a few restless nights, one notices that the patient is more irritable and complaining than usual. He is restless and finds it difficult to lie in bed. He feels a general lassitude but the nervous irritation prevents relaxation. There is a tired feeling about the eyes and a sense of muscle strain. After several days, extreme tiredness and depression are experienced on arising or weariness may develop a few hours later. Headache may develop in the afternoon, along with sweating, clammy hands, cold feet, and vasomotor disturbances. There may be an increase of fever and of pulse rate. A distressing effect of insomnia is gastro-intestinal disturbances. Food seems to lose its flavor, anorexia may become so marked that there is positive loathing for food. Alvarez has described this condition as a purely nervous indigestion and suggests for its treatment psychotherapy, sedatives, hypnotics, and special diets.

TREATMENT

Accurate diagnosis is essential. When due to physiological causes, a simple correction of them is indicated. Some cases will demand systematic study and sympathetic understanding. The patient in bed is not necessarily at rest. During the state of fatigue, the slightest physical or mental exertion must be considered excessive. Progressive relaxation as described by Jacobson, a method designed to teach the patient to overcome "residual tension," is of great value (see "Tuberculosis Abstract," March, 1930).

Hypnotics and sedatives have been much neglected and often misused. Morphine is a good pain reliever but a poor sleep producer. The author has used several somnifacients and finds that each of them has certain advantages under given conditions. He selects four drugs, such as paraldehyde, dial, bromural, and amytal, and uses them in succession but in equivalent dosage. Each drug is given about three times in succession and then another, until all four have been given, after which the process may be repeated. By this method, a variety is obtained and there is slight danger of developing a tolerance, even if continued indefinitely.

Drug therapy is aided by prolonged tepid baths, general massage, and alcoholic back rubs. Warm or hot drinks at bedtime seem to have a soothing effect in many cases. Black eye-masks prevent the patients being awakened by the light in the morning. Reassurance, or the inspiration of confidence, is, of course, necessary. Low protein diet is beneficial in some cases. Fresh air is a simple and useful remedy. In addition, some cases may profit by bromides, suggestion, persuasion, hypnotism, and perhaps by the analysis of Freud, but limitations and objections are common and the gap in therapy is apparent.—*Insomnia in Tuberculosis, W. C. Service, Am. Rev. of Tuberc., April, 1931.*

CASES OF PULMONARY TUBERCULOSIS WITH EARLY CAVITY FORMATION AND FEW SYMPTOMS: E. Buc (Revuew de la Tuberculose, 1930, X, 1096). "In certain cases one finds completely softened tubercles in the midst of crepitant lung tissue and in these cases the walls of the cavities are smooth and seem to be formed only by lung tissue a little compressed or thickened but without any trace of a false membrane." So wrote Laennec, nearly a hundred years ago.

Buc states that cavities are not always the result of the breaking down of large caseous foci and claims that they may appear very quickly, even in a few days, at the very start of a rapidly developing tuberculosis; in fact, they are often the first demonstrable lesions in cases that eventually become chronic. Without doubt from an anatomic point of view, the loss of substance is caused by the breaking down of a small caseous area, but this produces practically no clinical phenomena.

This cavity is almost always an unexpected discovery during an X-ray examination. As noted above, very few symptoms accompany its formation. There may be a persistent cough which annoys the patient or a small amount of sputum which is very viscid. Sometimes this expectoration is present at the very beginning; in other cases it is preceded by a few acute symptoms, a slight hemoptysis, or a febrile attack lasting a few days, or loss of weight and strength may be noted.

These symptoms are likewise often of very recent origin and have been present only a few weeks before the X-ray shows a cavity about which there can be no doubt, of considerable size. At this time the cavity is the principal lesion seen, it is isolated and solitary.

The broncho-vascular trunks may appear thickened but the parenchyma appears practically normal. Consecutive films show the formation and increase in size of such cavities. At first their contours may be faint and indistinct while the surrounding tissue is not much different from the normal lung. This is Jacquerod's first stage of cavity formation. In other cases, although symptoms have only lasted a few weeks, the cavity is already large, with definite borders, and it is surrounded by an area of lessened density. One might think the cavity was much older than the history of the case warrants. It is impossible to say from the film how long the cavity has existed, but there can be no doubt that it may appear without preceding consolidation of any great extent.

Outside of X-ray study, sputum examination is the most useful diagnostic procedure in these cases. The amount of sputum is usually very slight and patients may even say they do not expectorate; others will admit that they occasionally expectorate a small amount. Sometimes examination of feces will give positive results. When the cavity is present and enlarging, tubercle bacilli are usually found in spite of the paucity of symptoms. The syndrome really consists of three elements: X-ray evidence of cavity, positive sputum and comparatively good general condition. Such cavities may persist unchanged even for an entire year or more. Increase in weight may mislead one as to the seriousness of the condition. The spontaneous disappearance of such cavities is much less rare than is the case with other cavities due to tuberculosis. Often no trace remains. Of twelve cases, six underwent spontaneous cure under sanatorium care. Symphysis of the pleura seems to occur rather frequently in cases with cavities of the type under consideration. Artificial pneumothorax and phrenicectomy are valuable when there is no tendency to spontaneous disappearance, but they are not employed until a period of observation of several months at the sanatorium has demonstrated that no such tendency is present. In suitable cases they are most valuable, as they are followed by rapid disappearance of tubercle bacilli from the sputum. This is very important, since often on account of the appearance of good health and freedom from symptoms these patients are very dangerous to those who live with them.

A. T. Laird, M.D.

PEDIATRICS

THE USE OF RESPIRATORY VACCINE IN THE TREATMENT OF PNEUMONIA IN CHILDREN: Roy P. Forbes, M.D., Denver, Colo., and Charles L. Steinberg, M.D., St. Paul, Minn. (Arch. of Ped., Vol. XLVIII, No. 4, April, 1931.) Vaccine therapy in pneumonia as yet occupies no definite place in the armamentarium of the majority of physicians.

Lambert is apparently the first one to report the use of large doses of vaccine at frequent intervals in the treatment of pneumonia. Lambert's dosage in adults was one to two c.c. of a mixed vaccine containing 1,000 million organisms per c.c. and included:

Pfeiffer's bacillus	200 million per c.c.
Micrococcus catarrhalis	200 million per c.c.
Staphylococcus aureus	200 million per c.c.
Staphylococcus albus	200 million per c.c.
Pneumococcus	100 million per c.c.
Streptococcus	100 million per c.c.

The authors have followed Lambert's technic and give the vaccine routinely at six-hour intervals until lysis occurs, then at 12- or 24-hour intervals for a day or two. The concentrated vaccine which they have been using contains 2,000 million bacteria to the cubic centimeter, or twice the count of Lambert's vaccine. It is prepared by a Pacific Coast laboratory; and from .2 to .5 c.c. is given at six-hour intervals.

The vaccine treated cases frequently appeared less toxic 24 hours after the institution of vaccine therapy. Children who were previously stuporous and refusing all fluids enjoyed a more natural sleep and rest and took fluids when offered.

In uncomplicated cases, the lysis to normal temperature on the fourth or fifth day was noted.

In a series of 50 cases of pneumonia in children treated with large doses of respiratory vaccine at six-hour intervals, a mortality of 18.7 per cent was noted compared with a mortality of 27.3 per cent in the control series of 66 cases. When treatment was instituted within 48 hours of the onset, the mortality noted was 4.6 per cent as compared to 20.6 per cent in the control series. The evidence presented tends to prove that the treatment possesses real value, especially in early pneumonitis. The results in this series are strikingly similar to those obtained by Lambert and by Sutton in adults.

R. N. Andrews, M.D.

EFFICIENCY OF SCARLET FEVER ANTITOXIN: Taketo Tsuda, Mukden, Manchuria, China. (Amer. Jour. of Dis. of Children, Vol. 41, April, 1931, No. 4.) Since Dick and Dochez published their reports on an antitoxin for scarlatina, the use of antitoxin in the treatment of this disease has been generally adopted, and the majority of papers dealing with the subject seem to confirm the belief that antitoxin is effective, at least in removing the toxic symptoms, when an appropriate dose is prescribed at a proper stage of the disease. Prepared by the Hygienic Research Institute, South Manchuria Railway Company, Dairen, 1 c.c. of this preparation is said to neutralize more than 1,000 skin test doses of toxin; the author uses uniformly 40 c.c. for an injection.

The statistics suggest that an injection of a sufficient dose, given within twenty-four hours after the onset of the disease, brings about an absolutely reliable effect, as it reveals a 100 per cent recovery; also that the earlier the treatment, the better the results. Also, an injection within twenty-four hours after the onset prevents complications, and there will be more frequent cases of complications when patients are treated later. In this respect, the effect of the antitoxin is worthy of high appreciation.

The injection should be given as soon as possible, for the reason that the longer the treatment is postponed the less the influence of the antitoxin; no effect is to be expected when a patient is given injections seventy-two hours after the onset of the disease.

R. N. Andrews, M.D.

TUBERCLE BACILLI IN CHILDREN WITH ERYTHEMA NODOSUM:

Arvid Wallgren, M.D., Goteborg, Sweden (Amer. Jour. of Dis. of Children, Vol. 41, No. 4, April, 1931). The idea that erythema nodosum in children depends chiefly on a tuberculous infection has gained ground immensely during the last ten years.

Children with erythema nodosum usually do not cough. It follows that if one wishes to detect tubercle bacilli during this period of the tuberculous disease, they must be looked for in the stomach.

During the past year, the author had an opportunity to examine forty children with erythema nodosum, all but three of whom reacted positively to tuberculin. Of the thirty-seven children who reacted positively to tuberculin, seventeen had tubercle bacilli; in the remaining twenty the results of bacteriologic examination were negative. In the majority of the cases with positive tuberculin reactions there were more or less enlarged hilar shadows.

To sum up the whole question, it follows that children with erythema nodosum who give positive tuberculin reactions often excrete tubercle bacilli. This result proves that enlarged hilar shadows in the positive cases are of tuberculous etiology, and that the children really are suffering from tuberculosis; this ought to be regarded as an argument in favor of the tuberculous nature of the erythema. At the same time these researches yield the valuable information that children with erythema nodosum are often spreaders of infection, and that other children ought to be protected from contamination. Children with erythema nodosum must not go to school for a certain length of time after the disease has developed, and if they are admitted to a hospital they should be isolated.

R. N. Andrews, M.D.

ANTROTOMY IN CHILDREN DURING TONSILLECTOMY:

Dr. Simon Stein, New York (The Laryngoscope, Vol. XLI, Feb. 1931, No. 2). Sinusitis is frequently present and is responsible for a great many diseases and complications of childhood.

This preliminary report is based upon a group of 443 cases of antral infection brought to the author's office for tonsillectomy. The age ranged from one and one-third to ten years. These cases had a sinusitis in addition to the diseased tonsils and adenoids, and the sinuses were drained at the time of tonsillectomy and adenoidectomy.

The symptoms of sinus infection in children are persistent nasal discharge, nasal block, repeated colds, temperature, loss of appetite, poor development, reflex cough, and anemia.

Amongst children who had their tonsils and adenoids removed during the three years previous to this series, 116 out of 140 came back with a persistence of symptoms, which on examination proved to be due to sinus infection.

From then on antrotomy was done in 443 cases at the same time as the tonsillectomy and after one week the following results were noted:

1. The discharge had materially decreased in 103 cases.
2. The discharge had entirely disappeared in 250 cases.
3. The discharge had changed in character from a thick mucous or purulent one to a more fluid type in 90 cases.
4. The symptoms had disappeared entirely in 250 cases.
5. The symptoms were lessened in severity in 193 cases.

The 193 cases who still showed evidence of the infection responded to simple suction and baking under the infra-red lamp, within a period of from one week to three months.

Conclusions:

1. Sinusitis is a very common occurrence in children, and may appear at birth or at any time thereafter.
2. The symptoms are those of nasal obstruction, with discharge, headache, coughs, temperature, under-development, and systemic involvement such as joints or pyelitis, etc.
3. The case showing just a small amount of mucoid discharge may be just as severe in its effect as the one with a thin purulent one.
4. In this group of 443 cases the antral sinuses were drained in all cases brought in with diseased tonsils and adenoids, when either the history or physical findings pointed to a sinus involvement, whether mild or severe in character. This procedure is a perfectly safe one, and has given no untoward results.
5. Constitutional treatment is very important. One should always remember coincident allergic or other conditions which, with the sinuses, give the symptoms of the disease.

Lucian G. Culver, M.D.

POST-VACCINAL ENCEPHALITIS IN INFANCY:

F. T. McNair Scott (Brit. Jour. Child. Dis., 27:17, Dec., 1930). Scott reports the occurrence of post-vaccinal encephalitis developing ten days after vaccination of an infant six months of age. Eight other patients were vaccinated from the same supply of lymph, two being infants of four months, and six being adults whose ages ranged from sixteen to forty-six years. In none of these cases was any complication noted. The case reported by Scott recovered, appearing perfectly normal mentally and physically ten weeks after the onset of the condition. Scott calls attention to the fact that eleven cases of post-vaccinal encephalitis in infants under one year of age have been reported in England since 1923. In Germany and Holland twelve and three cases, respectively, have been recorded as occurring in infancy. A few similar cases are also reported from Sweden, France, Switzerland, and Poland. Scott notes that the cases reported fall into the following five groups according to their clinical picture:

1. Meningitis type, in which symptoms are mainly those of meningitis.
2. Cortical type, in which the outstanding and often the only clinical manifestation is convulsions.
3. Type resembling tetanus, in which signs are trismus and opisthotonos.
4. Brain stem type, resembling encephalitis lethargica, and characterized by drowsiness, ocular palsies, facial palsy and choreic or tonic movements of the limbs.
5. Lower motor neuron type, resembling poliomyelitis.

The mortality varies considerably with the type of case, being much higher in the first three groups (66 to 75 per cent) than in the other two. The condition occurs with exceeding rarity in children, showing an incidence in Europe as estimated by Scott of one case in approximately every 1,800,000 vaccinations.

The author concludes that infants are very liable to small-pox and that the mortality is high, whereas infants are rarely attacked by post-vaccinal encephalitis. It seems right, therefore, to urge the continuation of compulsory vaccination in infancy if performed with precautionary measures as outlined. He ends with the significant quotation from Sir George Newman: "Cases of post-vaccinal encephalitis are more frequent in countries where vaccination is declining than in those in which the proportion of vaccinated persons is high."

C. A. Stewart, M.D.

THE TREATMENT OF EPIDEMIC MENINGITIS: J. B. Neal (New York State Med. Jour., 30:79, Jan., 1930). The Meningitis Division of the Research Laboratory of the New York City Health Department, of which Dr. Neal is a member, does not look with favor upon intensive methods of treatment of meningitis which includes intravenous and intramuscular combined with intraspinal injection of antimeningococcic serum. Their experience has been rather extensive, including the supervision of the care of more than 1,000 cases of epidemic meningitis during the past nineteen years.

The plan of treatment instituted calls for the immediate administration of serum whenever a cloudy spinal fluid is found. Intraspinal injections in amounts of 20 c.c. are given daily thereafter, until at least two successive spinal fluids show no organisms by smear or culture. It is desirable to drain the subarachnoid space as completely as possible, removing 50 to 60 c.c. if possible. The drainage should be done slowly and carefully, especially if the fluid is under considerable pressure. When large amounts of spinal fluid are removed, more serum may be administered. The dosage of antimeningococcic serum given intraspinally depends on the amount of fluid withdrawn, and on the ease with which the serum runs in by gravity. This applies to young as well as to older patients; thus graduated doses adjusted to age are not used for small children. The only condition for which spinal puncture and serum administration is done more often than once every twenty-four hours is limited to cases in which the intraspinal pressure is greatly increased.

At least four doses are usually required, and the average patient received six to eight injections. If symptoms do not improve after two sterile fluids have been obtained, more serum is given. Intravenous and intramuscular injections are used only in cases of meningococcic septicemia, or in cases of meningitis with positive blood cultures or a rash that tends to persist and recur.

From the standpoint of prognosis the cell count itself is of little value, since the outlook is bad if the fluid becomes clear and the organisms persist. A return of the spinal fluid sugar to normal is a favorable sign.

In blocked cases serum may be administered by ventricular taps or cisternal punctures. Neal prefers ventricular taps, since she has seen no immediate harm from such procedures, whereas death from hemorrhage occasionally followed cisternal puncture.

C. A. Stewart, M.D.

SURGERY

IMMEDIATE AND REMOTE END-RESULTS FOLLOWING OPERATIONS ON THE BILIARY PASSAGES: Hans Kment (Bruns Beitrage zur klinischen Chirurgie, 1930:150:534). The author points out that disease of the biliary passages treated by surgical methods usually has a lower mortality—9.22 per cent (Hotz)—than when treated by purely medical non-surgical methods, as 8 to 10 per cent (Tollquist), 10.2 per cent (Jogluttis), 10 per cent (Binder) and 15 per cent (Naunyn).

(A) IMMEDIATE RESULTS FOLLOWING OPERATION

The series of cases discussed in this paper comprises those in which operation was performed in this clinic between 1912 and 1924 and totalled 427 in number. There were twenty-nine deaths, making a mortality of 6.79 per cent exclusive of cases complicated by carcinoma and pancreatitis. This series included many of Schloffer's private cases. The author compared the above mortality with that of Florchen, Suermondt and Enderlens, which varied from 4.5 to 6.6 per cent, and with that of Brentano, Hueck and Fink, which varied from 13.2 per cent to 14.7 per cent.

Many of the cases in this series were serious, with common duct occlusion. This was attributed to the close proximity of the Karlsbad and other watering places. Patients sought non-surgical relief at these places, deferred operation and when finally operated were in advanced stages of biliary tract disease. The average duration of the disease in Schloffer's private cases at the time of operation was six years with a mortality of 9.3 per cent compared with the charity cases of the clinic, in whom the average duration was 3.5 years with a mortality of 5.92 per cent.

Of the above twenty-nine deaths, six were due to peritonitis, five were due to cholangeitis, four pneumonia, one pulmonary gangrene after pneumonia, seven cardiac disease, two shock, one hemorrhage, two parotitis, and pyemia and one pulmonary tuberculosis.

One-third as many deaths occur if operation is performed after the first attack of gall-bladder disease (Finsterer, Anschutz).

Of the above 427 cases, 213 were interval cases in which simple cholecystectomy was done. The mortality was 1.4 per cent. When in addition to simple cholecystectomy, appendectomy, gastric resection, pyloroplasty, etc., were done, the mortality rose to 2.04 per cent.

When operation was performed for acute urgent cases like gall-bladder perforations, empyema, acute common duct occlusions, etc., the mortality rose to 14.5 per cent for 117 cases. When the main bile ducts had to be opened the mortality jumped to 46.1 per cent.

The author had two cases which died twenty-four and thirty-six hours, respectively, after onset of their first attack of biliary disease. Both of these were markedly jaundiced and died of hemorrhage.

Coagulation time of the blood has no relation to depth or degree of jaundice. In the jaundiced patient the bile salt concentration of the blood is never increased to the point where it can inhibit coagulation. The hemorrhagic diathesis is due to functional disturbances of the liver.

A third group of cases reported were the protracted acute or subacute cases with no tendency to heal. These represent cases of stone occlusion of the common duct. Operation was not immediately imperative in these. On the author's series 31.4 per cent of the cases of common duct stones had no icterus; Arnsperger, 15.5 per cent; Pauchet, 30 per cent.

In the cases of fifteen transduodenal choledochotomies performed, the mortality was 13.3 per cent; Lorenz, with 136 cases, 15 per cent. Pancreatic injury never seen by this method. Drainage was always instituted for stones thought to be left behind and in presence of cholangeitis. Stenosis as a result was never seen.

Cholecystostomy was performed in 21 cases as an emergency operation in cases of empyema of the gallbladder and in cases of abscesses in the surrounding region. His mortality was 9.5 per cent. This operation was always followed, usually at the end of four weeks, by the secondary cholecystectomy.

Of the 427 operated cases, 98 were in males and 329 were females, a ratio of 1:3.3.

The occurrence of the first attack of gallbladder disease was in more than 33 per cent of all the cases during pregnancy, parturition or the puerperium. This the author believe to be due to mechanical factors, infection and particularly puerperal infection. In spite of the high cholesteremia, Lichtwitz says, pregnancy and parturition precipitate the first attack but not stone formation, which he believes is pre-existent.

Pregnant and puerperal women with cholecystitis have an especial tendency toward severe complications, like perforation of the gallbladder, empyema and pyemia. The condition is mistaken for puerperal fever. Cholecystectomy is advisable during the first six months of pregnancy. Interruption of pregnancy is contraindicated.

In 243 interval operated cases there were 23 with jaundice in whom no common duct obstruction was found. The jaundice was attributed to spasm of either the sphincter of Oddi or of the duodenum.

Choledocho-duodenostomy was performed in cases with irremovable obstruction in the ampulla of Vater.

Causes of recurrence of symptoms after cholecystectomy were attributed to (a) stenosis of ampulla, (b) duodenal spasm, (c) cholangeitis, (d) overlooked stones, (e) mistaken diagnosis, (f) pancreatitis.

One-third to one-half of all cases of gallbladder disease develop their first attack after forty years of age.

Mortality in cholecystectomy is proportional to age, because of greater duration of the disease.

Gallbladder disease occurs earlier in life in women than in men but the mortality is greater in the latter.

Hypo- and hyperchlorhydria were found about equally frequent in cholecystic disease.

The author uses the oblique incision, parallel to the lower costal border, in his cholecystectomies. In 191 cases answering out of 329 cases operated, eleven, or 5 per cent, developed incisional herniæ. These required drains for infection. Of forty-two cases with pararectus incision, eighteen answered and three, or 16 per cent, had herniæ.

The author used lumbar anesthesia in 143 recent cases.

Prolonged drainage from a wound following simple uncomplicated cholecystectomy is due, not, as commonly believed, to slipping of the ligature on the stump of the cystic duct, but to injury of the so-called ductus hepatocystici (Odermatt), or to vasa aberrantia. The author drains all his wounds.

There were 39 cases of carcinoma of the gallbladder in this series: Twelve (30 per cent) died from the operation (cholecystectomy), six from peritonitis, three from hemorrhage, one from heart failure, two from cachexia. Of fourteen cases with primary carcinoma of the gall bladder, five had icterus and of these, two had metastases to the liver. Two cases (radically operated) lived two years each and the rest (palliatively operated) died within about seven months. Many, however, were relieved of their icterus and life made more tolerable.

In ten of the primary carcinoma cases, stones were found in the gallbladder.

(B) END-RESULTS AFTER OPERATION FOR INFLAMMATORY DISEASES OF THE GALLBLADDER

In this second part of the paper the author reviews the end-results on all the follow-up cases. All these were operated previous to 1924. As criteria of success following cholecystectomy he uses (1) freedom of symptoms, and (2) capability of working, as his yardstick. He received complete reports on 293 cases, or 73.1 per cent of all operated cases. Of these, 91 per cent were completely capable of work and 8.4 were capable either of light work only or were incapable of any work whatsoever. He divided the 293 cases into five groups as follows:

(A) Fully capable of work—250 cases

1. 208 cases (76.6 per cent) completely symptom-free.
2. 29 cases (10.5 per cent) improved.
3. 13 cases (4.7 per cent) slight improvement.

(B) Unhealed cases—23 cases (8.4 per cent)

4. 9 cases (3.2 per cent) symptoms limit amount of work or make them totally incapable of work. Symptoms, however, improved after cholecystectomy.
5. 14 cases (5.1 per cent)—(incapable of any work whatsoever)
    - (a) Recurrent cases.
    - (b) Operation didn't improve condition.
    - (c) Operation made their condition worse.

(C) 18 cases died of intercurrent infection in no way related to their biliary disease.

Two cases unaccounted for by author.

Total 293 cases.

The Lyon method of biliary drainage with $MgSO_4$ and hypophysin was reported good in many cases. It is contraindicated in phlegmonous cholecystitis and acute cases because of danger of perforation.

All cases whose symptoms had not lasted longer than one week previous to operation and who had no previous biliary attack were permanently cured by cholecystectomy.

Of fifty-seven cases on whom cholecystectomy plus hepaticus drainage or transduodenal choledochotomy was performed, forty-one, or 71.9 per cent, could be re-examined. Two, well one year, died of intercurrent disease, as well as two on whom a secondary laparotomy was performed. Of the remaining thirty-seven, twenty-nine (78.4 per cent) were completely healed, four were essentially better and one so much better he is capable of work.

The author believes it is not so much the duration of the disease previous to operation which governs the end-results as the type of the original disease, *i.e.,* frequency of attacks. The greater the frequency of attacks the worse the prognosis.

Of twenty-six cases, originally operated for empyema of the gallbladder, 21.7 per cent could not work. This was attributed to complications like indurative pancreatitis and cholangeitis. The end-results are better if cholecystostomy is done first, followed later by cholecystectomy. If the gallbladder wall is severely involved, *i.e.,* gangrenous, he does cholecystectomy primarily. When bile in these cases is bacteria-free, they may almost always be found in cultures of the wall. The author cannot agree with Rovsing and other Nordic surgeons in doing only cholecystostomy as the operation of choice. He thinks highly of cholecystostomy as an emergency operation.

H. J. Dvorak.

ANURIA—REPORT OF NINE CASES: Daniel N. Eisendrath, Chicago (Jour. of Urol., April, 1931, Vol. XXV, No. 4). Of special interest to the surgeon who deals with urinary diagnosis in surgery, is the report of nine cases with a rather thorough discussion of this subject by the author, from the standpoint of both diagnosis and treatment.

Anuria is grouped in three types: (a) Secretory. (b) Obstructive. (c) Transitional or combination groups of anurias.

The secretory type is due to cessation of secretion proximal to the kidney or within its parenchyma, and caused by a disturbance of circulation proximal to the kidney itself, such as a vascular spasm of the main renal vessels, as the result of stimulation of the splanchnic nerves; or reflex inhibition of secretion, as the result of peripheral irritation, such as after passing of urethral instruments, after sudden evacuation of the bladder, and after ureteral catheterization; or embolism or thrombosis of the main renal vessels of both sides or of one side with reflex irritation of the opposite kidney; or a marked decrease in blood pressure as often seen in shock; or dehydration due to loss of large quantities of fluid, as seen in cholera, severe hemorrhage, intestinal obstruction with repeated emesis; as well as in advanced cardiac decompensation. Disturbances of the renal parenchyma include the various types of nephritis and nephrosis, such as anuria after scarlatina, bichloride, and similar chemical nephroses, and the anuria in pregnancy, and after nephrectomy. In the latter case, the parenchyma changes in the remaining kidney have either been overlooked or underestimated. Prostatectomy may be followed by anuria. The majority of these are due to renal parenchyma changes, but many are best explained by peripheral irritation. Anuria is comparatively rare in bilateral tuberculosis, neoplasms and polycystic disease.

The second, or obstructive type, is due to unilateral block by calculus, stricture, injury to neoplasm with normal opposite kidney, due to reflex inhibition of the secretory activity of the opposite organ; or a unilateral block by calculus, stricture, injury or neoplasm with congenital absence, lack of development, or complete loss of function, as the result of disease or injury, or due to the absence of the opposite kidney as the result of a previous operation; or due to bilateral block by calculus, stricture, etc.

In the third, or transition or combination group of anurias, the author places those which follow transfusion, burns, gas bacillus infection, potassium chlorate poisoning and blackwater fever from malaria, because of the obstructive factor of the concentrated blood in the renal tubules by hemoglobin crystals, and the interference with the secretory activity of the renal parenchyma.

The author then reviews the typical urologic examination, laying stress on the importance of diagnosis before the end of the period of tolerance is reached. By the period of tolerance he means the interval between the time when the anuria is first noticed and the appearance of symptoms of uremia. The examination includes:

(1) Palpation of the abdomen for enlargement of one or both kidneys.

(2) Catheterization of the bladder to determine the absence of urine.

(3) Plain radiography, to determine the presence of

calculus, remembering that about 15 per cent of all renal and ureteral calculi are shadowless.

(4) Cystoscopy and ureteral catheterization. Pyelography is contra-indicated during an anuria, but can be done a few weeks later.

(5) Blood chemistry, to determine non-protein nitrogen contents and creatinin.

The treatment of anuria is listed in the following steps:

(1) Administration of large quantities of fluid.
    (a) By proctoclysis.
    (b) Hypodermoclysis.
    (c) Intravenous administration.
    (d) The use of the duodenal tube.
(2) Nerve blocking—overcoming splanchnic nerve irritation.
(3) Decapsulation.
(4) Ureteral catheterization.
(5) Operative measures.

The nine cases reported are very instructive, and there are nine illustrations.

A. E. Sohmer, M.D.

OPERATIVE TREATMENT OF SYRINGOMYELIA: Dr. G. Ellmer, Tubingen, Germany. (Der Chirurg, Vol. 3, No. 6, March 15, 1931.) The author states in his review of this subject that the operation of syringomyelotomy, which was proposed by Poussepp in 1926, has not been done frequently to date. The literature, up to the summer of 1930, reports sixteen cases, of which two came from German Clinics (Foerster, Schmieden). In almost all of the cases improvement occurred. Oppel, who operated six cases, had one poor result, and Gehuchten reports a case in which there was improvement for several months, but returned to the original condition after one year.

The present author reports a case which he operated over a year ago. A carpenter, age 25, developed an increasing disability of both hands. Small wounds healed slowly; movement of fingers was interfered with, and sensation became dulled, with pain on exposure to cold. These changes were more marked in the left hand than in the right. After one and a half years, it gradually increased, so he was completely disabled from work. His general health was good; the cranial nerves showed a weakness in the facial on the left side; the left pupil and palpebral fissure were larger than the right; there was atrophy of the thenar and hypothenar regions, and in the interosseous spaces; the fingers assumed a claw-like attitude; the right hand showed the same changes, but less marked; motility of fingers was more disturbed on the left side than on the right; there was bilateral hypalgesia; temperature sense was moderately disturbed; the abdominal reflex was absent on the left side, and there was bilateral positive Babinski.

The diagnosis was syringomyelia, pointing to an involvement of the cord in the region from the sixth cervical to the first dorsal segment. Myelography was made; 35 minutes after injecting the contrast fluid suboccipitally, it showed exclusively on the right side, due, no doubt, to the greater involvement of the left side of the cord; after 65 minutes the contrast fluid was halted at the level of the seventh cervical vertebra; two hours later the greater part of the fluid was at the level of the third dorsal vertebra, and after 24 hours it had all passed to lower regions. It gave an indication of the probable location of the intramedullary cyst in the lower cervical region.

Operation was done under an avertin-ether-narcosis; laminectomy from the sixth cervical to the fifth dorsal was made. The dura seemed under tension somewhat and showed but slight pulsation. A small stab incision released fluid under considerable pressure, the fluid spurting up to a height of 5 cm. Enlargement of this incision showed that the intramedullary cyst was entered, and the fluid, therefore, was cyst contents, the high intramedullary pressure pressing the cord against the dura; the wall of the cyst was thin; probing showed the cyst extending for a considerable distance up and down—the exact extent not being determined. A strand of muscle tissue was inserted in the opening to prevent closure by adhesion; the dura was carefully closed and the wound likewise, in layers. Convalescence was smooth.

The day after operation, the patient was rid of the feeling of cold in his hands. There seemed to be better circulation, and they were warmer on discharge from the clinic; five months later there were no further changes; again one year later there were no further changes. Considering that the disease before operation was advancing rather swiftly, the fact that there was a standstill of further progress for a period of a year after operation was enough to justify the same. The earlier the drainage is done, the better would be the result, because it is known that cord tissue once degenerated cannot regenerate.

The other cases reported in the literature also, excepting one, showed definite improvement. In discussing the technic of the operation, the author compares the incision in the posterior median fissure to that in the region of the antero-lateral column, as performed by Oppel; the latter incision being that which is usually done for cordotomy; excepting that for syringomyelia it is lengthwise instead of transverse.

The author concludes by suggesting this operation in cases of advancing syringomyelia; in this way preventing an advance of symptoms, such as would be caused by increasing pressure causing destruction and degeneration of the spinal cord tissue. The latest postoperative report was by Foerster, whose patient, after two years, was practically well.

A. E. Sohmer, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Health on the Farm and in the Village. C.-E. A. Winslow, Dr. P. H. Professor of Public Health, Yale School of Medicine. 281 pages. Illus. Price $1.00. New York: The MacMillan Company, 1931.

Textbook of Histology. Eugene C. Piette, M.D. Pathologist and Director of the Laboratory of the West Suburban Hospital, Oak Park, Illinois, etc. 466 pages. Illus. Price $4.50. Philadelphia: F. A. Davis Company, 1931.

A TEXTBOOK OF SURGERY. John Homans, M.D. 1,195 pages, with 513 illus. Price $9.00. Baltimore: Charles C. Thomas.

The modern tendency of medical textbook writers to serve more as editor than as author is evidence of healthy modesty and is to be commended highly as conducive to reliability and accuracy. This volume is the result of a concerted effort by the department of surgery of Harvard Medical School to provide an adequate textbook of surgery for medical students. Doctor Homans accepts full responsibility for the entire contents and the words are all his, but the essence of most of the chapters was furnished by twenty-three members of the faculty, and they approved each chapter in its final form. Surgery is too great a subject for the compass of any one mind and the authoritative scope of this volume is extended by its collective authorship. It may be worth mentioning that this is one textbook which was not written at the solicitation of a publishing house.

The book is well put together and attractively printed. There are a few typographical errors, as creep into most first editions. The paragraph headings are selectively italicized or printed in bold-face type to facilitate finding a subject one may be seeking. The book is not cumbersome nor so large as to be appalling to the medical student. The illustrations are almost entirely line-drawings, which are not beautifully decorative but admirably serve their purpose of illustrating the subject matter of the text. The author's style is easily readable, concise, and he usually says the things the student wants to know, or at least should want to know. No ambiguities were noted.

The author rarely attempts to teach that which is not learnable from books; there is little space devoted to operative technic. However, certain technical procedures that a medical student is apt to be called upon to do, such as lumbar puncture, are described in detail in smaller type. Anesthesia might have been given a little more consideration. The subject index of twenty-three pages might be even more detailed to enhance the value of the book as a reference volume.

A feature of the book is a brief historical account at the beginning of each chapter. These are invariably interesting, usually instructive, and constitute about the amount of medical history that the average medical student can be persuaded to read at any one time. Another feature of the book is an unusually complete bibliographic index, which gives also many old original references of classic works.

This book represents the best of surgery as practiced in a foremost medical center; a center rarely given to fads nor yet as conservatively reactionary as some enthusiasts would say. It is a textbook from a group whose leadership in the field of medical education has been well recognized. The medical student will find in it the principles of surgery easily grasped; it beautifully fulfills its purpose for him. The internist and specialist may determine from it the practice of present day surgery. The surgeon may read it with profit as a standard with which to compare his own practices. The need for such a volume and the completeness with which this book fills that need justify a prediction for it of widespread circulation and usefulness.

T. Lincoln Hyde, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

EXPERIENCED LABORATORY TECHNICIAN wants position in hospital, clinic, or doctor's office. Best references furnished. Address D-137, care Minnesota Medicine.

WANTED—Well trained and active internist to become associated with well established group in Minneapolis. Address D-140, care Minnesota Medicine.

WANTED—Well trained X-ray technician, one with nurse's training preferred, who has had experience, and is also able to handle physiotherapy department, including diathermy and lamp treatment. Lady with several years' experience preferred. Address D-139, care Minnesota Medicine.

MEDICAL SECRETARY desires temporary or permanent position in doctor's office. Minneapolis preferred. Three years' experience. Telephone Gladstone 3635, Minneapolis.

WANTED—Position as medical technician in a hospital or clinic; or position as a technician and office assistant. Minneapolis General Hospital laboratory training and experience. Address D-138, care Minnesota Medicine.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

Vol. XIV AUGUST, 1931 No. 8

PRESENT DAY PROBLEMS*

L. Sogge, M.D.
Windom, Minnesota

THE scientific and industrial achievements of the first quarter of the present century have so far outdone those of the preceding quarter of a century that they may be typified by a comparison of the automobile to the bicycle; an aëroplane to a toy balloon; a motion picture to a tintype. The progress of America during this period was markedly more important in the field of science, the invention and perfection of mechanical processes, and the extension of knowledge, than in the field of politics. The more formal historians would probably say that the most important event since 1900 was America's participation in the Great War. Any attempt at contradiction puts a heavy burden of proof on the proponent. Nevertheless, it is a reasonable query whether there is not equal importance in the fact that during this period the average man's tenure of life has increased by about seven years. In a history which aims to keep in mind the average man, it may be that the scientists, who, by discoveries in the field of prevention and cure of disease, increased by about 15 per cent that average man's tenure of existence on this earth, multiplied his defenses against disease, and prolonged his existence, should appropriately be given as much mention as the politicians and military leaders who conducted us into and through the Great War.

As a concrete illustration, chosen chiefly because of the coincidence in time and place that gives it vivid concreteness: On the Isthmus of Panama during the early years of this period three things occurred: One, political; a revolution, and some further transactions having to do with the government of the United States. The second, in the field of engineering, the digging of a canal which reduces by 8,000 miles, and by upward of twenty days, the transporting of goods and passengers by water between the Atlantic and Pacific coasts of the United States. The third, in the field of science, the proof that yellow fever is caused by infection from mosquitoes, and the beginning of the wiping of that disease from the face of the earth. This discovery also led to the prevention and cure of other diseases due to animal parasites.

Walter Reed, in August and September of 1900, proved that yellow fever was caused by the mosquito, and Gorgas' achievement more than any one act of government or engineers made possible the digging of the Canal.

Who can say but that Henry Ford as the manufacturer of inexpensive automobiles may have had a more far-reaching effect on the lives of the average Americans than Warren G. Harding; that C. Latham Sholes, who invented the typewriter and thereby was largely responsible for the introduction of women into business offices, was of more fundamental consequence to a larger number of human beings than Joseph G. Cannon; that the discovery of the remedy for diabetes may have done more for human happiness than the entire thirty-one years of Henry Cabot Lodge in the Senate; that the acquisition of the Philippine Islands may have been of less real consequence to the average American than the increase in the effectiveness and abundance of fly-paper and window-screems; that the perfecting of the vacuum cleaner and the electric flat-iron may have meant as much to the average woman as the bringing of woman suffrage?

At the present time there is no difficulty in demonstrating to the satisfaction of most people that a nation's greatest asset is physical and mental health. The prosperity and happiness of a people are largely dependent upon mental and physical vigor. I believe it is also correct that our knowledge of diagnosis, treatment, and prevention of disease is far in advance of its application to the needs of an individual or community. The largest problem, therefore, before the medical profession at this moment is the closing of that gap which will make the application of our present knowledge both available and effective. Any scheme dealing with public programs must be judged ultimately by the effects it has upon the individuals whom it is designed to help. If that is true, a plan of medical service must be judged from the effects upon those in need of medical advice and treatment and the cost of services rendered. Because of the technical character of medical service it is reasonable to insist that it be provided by those who have had training which qualifies them to perform it. The essential feature of a competent and effective medical service is trained and informed personnel. Today, the public has become health conscious and desirous of obtaining the benefits of the present day knowledge regarding disease and its prevention.

---

*Presidential Address presented before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

We, as a profession, should be responsive. A country which endeavors to regulate by law its industries and railroads and to manage a scheme of compulsory universal education is likely to make an effort to improve and conserve its greatest asset, the health of the people. Whether the scheme to be used will be sound depends to a considerable extent upon the type of leadership in the program. If we are right in assuming that every individual in the community should receive the benefits of modern medical knowledge, and that considerable numbers still do not receive such benefits, it is more than likely that efforts by amateurs, social uplifters, politicians, and others will be made to correct that situation. The fact is that we have now in America a new professional group, the social worker group, with its specialized training and its diversified interests that are as wide as all society. These new professional men and women are professionally interested in poverty and sickness. It is only another step, and a step which they make with enthusiasm, to interest themselves in the medical profession and its problems. The committee on the cost of medical care is one practical result of this intelligent active interest, and when this final report comes will we be like the Trojans, alarmed when their enemy leaped at them from the wooden horse, or will we be ready to lead and guide? It matters not how sincere these efforts are or how serious some of the difficulties in the distribution of medical care may be, there are certain fundamentals which will determine the ultimate success of any plan.

There are several phases to this problem. First, the economic. Second, the professional organization which will provide a proper distribution of professional services to meet effectively the actual needs of the community. No plan of medical care can be fully successful without intelligent public opinion and coöperation based on confidence in those conducting the program. Third, the educational program necessary to keep this personnel abreast of any knowledge and methods constantly being developed in medicine and prevention of disease.

Most attention has recently been directed toward the economic aspect of this problem and an effort has been made to create the impression that the cost of medical care is unreasonably high. All of you are familiar with the fact that at all times an average of 2 per cent of the population is incapacitated and about twice that percentage is impaired or handicapped. The financial loss to the country represented by lost earning power and reduced production totals well over two billions of dollars a year or equivalent to one-half the cost of maintaining the national government. The economic features associated with preventable and premature deaths represents a very large loss which we shall not try to estimate at this time. The cost of medical care per family per year is shown below:

Patent medicine and drugs	$ 25.00
Physician	24.00
Hospital (civil)	15.00
Nursing	8.00
Dentist	6.00
Non-medical practitioner	2.00
	$ 80.00

The total expenditures represent a little over 2 per cent of our national income.

A few illustrations of our national expenditures per family per year follow:

Passenger automobiles	$150.00
Tobacco	67.00
Candy	37.00
Gasoline	37.00

Movies and entertainment	35.00
Soft drinks, ice cream, gum	34.00
Jewelry and furs	29.00
Radio and musical instruments	16.00
Sporting goods, toys, games	16.00
Perfumes, cosmetics, toilet soaps	15.00
	$436.00

These items total about five and one-half times the total cost of all non-governmental health service. The amount expended on tobacco is almost three times as much as that expended for physicians. We spend a great deal more for candy than we do for doctors. Our expenditures for entertainment are twice those for the maintenance of civil hospitals. We spend twice as much for perfumes, cosmetics and toilet soap as we do for nursing. The explanation for that situation is not difficult to find, for the people of the country buy what they are taught to buy. One billion, five hundred thousand dollars are expended each year in that education by means of advertising, and W. E. Humphrey, Federal Trade Commissioner, states that the publication of fraudulent advertising in magazines and newspapers costs the American public about five hundred million dollars annually. It has been estimated conservatively that the vital or human value of the American people, if one were to expend it in monetary value, is about five times the material wealth of the country. The latter is over three billion dollars, which means that the expenditures for all forms of medical service are about two-tenths of one per cent of the human value. In fact, there is every reason to believe that the present expenditures for medical care may be insufficient to create an adequate service. Certainly they are reasonable.

However, the fact that the cost of medical care is not overwhelming does not relieve the medical profession of its responsibility for working out a satisfactory and more universal plan of medical service. Many methods have been employed in different countries to try and solve this difficulty. We have at present twenty-three countries which have adopted the principle of compulsory health insurance, and seventeen countries that have voluntary health insurance. We all know more or less about the effect of the insurance plan. It is time now to study it thoroughly, to see if we want to be tied up by any such plan. It does not follow for one moment that national insurance on a compulsory or voluntary basis is the only method of dealing with this situation. There are many who believe that it is possible to avoid this serious difficulty of national insurance by the development of other schemes which will retain the advantages and strengthen the features of individual and voluntary effort, and that there are fundamental advantages in the American scheme which need to be capitalized and made more widely available, which a governmentally regulated medical service is likely to destroy.

Let me mention a few of these advantages: The number of hospital beds in the United States has increased 127 per cent in the last twenty years. The capital value of hospitals in the country at present is about $4,100,000,000, and this is an increase of 2,500 per cent in twenty-five years. The cost of hospitalization last year was about $12,000,000 as compared with $1,400,000 in 1904. Fifty-eight per cent of the counties in the United States now have general hospitals as compared with 44 per cent in 1920. Visiting and public health nursing, school nursing, care of well babies, pre-natal clinics, etc., indicate further efforts to provide medical care.

Many industries are establishing comprehensive medical services, some on a local insurance basis. Another feature to be mentioned is the tremendous growth of various schemes of voluntary taxation commonly designated by the term "Community Chest." Over 350 cities now have a Community Chest and last year more than $60,000,000 was raised by them for various forms of social and medical relief.

It is hardly necessary to discuss the tremendous expansion in our idea of what constitutes adequate medical care in the light of the present day knowledge. It has been inevitable that the cost of medical care should rise, but the increase in the cost of medical service since the beginning of the century is small compared to the increase in expenditures in many other fields. Let me call to your attention the fact that the national income of this country has increased from thirty-one billion dollars in 1910 to eighty-nine billion in 1928. It is very doubtful whether provision for medical and health work is receiving an undue proportion of that increase when it is recalled that medical knowledge has been increasing at a phenomenal rate and that the largest part of the increase in the cost of medical care arises out of that new knowledge and new methods based on it. Mention need only be made of the growth of hospitals, laboratories, nursing, X-ray, dentistry, physical therapy, and specialists to suggest elements in the greater cost which arises from the great increase in the knowledge required for proper diagnosis and treatment. Allowing for the inevitable increase in the cost of proper medical care there are, however, a number of unnecessary costs which we, as a medical profession, can avoid. Some of these are: unnecessary laboratory work, unnecessary surgery and unnecessary hospitalization, and the public's self-selection of specialists.

In considering medical economics one cannot ignore the problem of the distribution of physicians in rural communities. May I mention only two general features of this question. During the last sixty years the number of gainfully employed persons in this country who were in agricultural pursuits has dropped from 47 to 18 per cent. The contribution of agriculture to national income has dropped from 26 to 9 per cent. It will be noted that whereas 18 per cent of those gainfully employed are still in agriculture they produce only 9 per cent of the national income. Physicians in a society of free competition are bound to react to the economic standards for rural communities and that is probably the largest factor in the uneven distribution of physicians. This problem is not unique in this country. Good roads, the telephone, and the automobile have done much to meet the problem in this country. A satisfactory solution will be found, but we must not resort to methods that are too artificial. There is probably no single solution. However, there are certain general principles that might be emphasized. One of the most important is that of the prevention of disease. Everyone will agree that a considerable portion of illness and disability is preventable. We must do all we can to shift the best interest of the medical profession from ill health to good health. The physician must become a health trainer and advisor as well as a healer. It seems quite clear that the development of a fundamental basic medical service must include provision for the practice of preventive medicine as an integral part of practice. A second important emphasis should be placed upon the basic medical service which should be provided for the entire community, not alone for the small proportion which is under treatment. A third suggestion is the organization of the professional industries. Specializing is an essential part of modern medical service but it is the responsibility of the medical profession to see that those who claim to be specialists are in fact experts in their fields. A fourth and very important feature is to provide ways and means of continuing the education of physicians in practice. This applies to the general practitioner as well as the specialist. The social, economic, and educational features of any program designed to infuse the entire profession with knowledge of new discoveries and the application of new methods should occupy the most thoughtful consideration of the medical educators and practitioners. Knowledge is not distributable in packages like commodities and should be only in the hands of those who are trained to use it.

In conclusion, there are two outstanding trends of our age, the democratic and the scientific. The success of any democracy depends upon leadership. We look for such leadership in law, education, business, and banking and there is no reason why the public should not expect it in medicine. We possess the knowledge and personnel to solve a large national problem and possessing that knowledge we are responsible for working out the satisfactory solution. We cannot hope to enjoy that leadership to which we are rightfully entitled in modern society by constantly opposing the proposals intended to deal with medical problems even when those proposals are vague and obviously unfit and offered by those unfamiliar with the essential character of the problem.

What we need is a constructive program directed and supported by the best brains of the medical profession which will aim to provide and retain leadership in health needs and in the program of medical service through proper organization of the profession. Some scheme of medical post-graduate education, and constructive public policy and publicity—this is the challenge to the organized medical profession in this country. It can be met only by wise, far-seeing, unselfish, constructive leadership. So we can say like the Ancient Ægean Mariner who, when tossed by the storm, prayed to Neptune, "Oh Neptune, thou canst save me, if thou will; thou canst sink me, if thou will; whatever comes I'l keep my rudder true."

REFERENCE

Rappeleye, W. C.: Some problems of medical service Ohio State Med. Jour., 26:749-754, (Sept.) 1930

UNDULANT FEVER*

ARTHUR C. FORTNEY, M.D.
Saint Paul

DURING the years 1924 and 1925 in the United States (exclusive of Texas, Arizona and New Mexico) ten cases of undulant fever were reported in six widely separated states. During 1928 and in the first five months of 1929 more than 1,000 cases were reported in 42 states. In Minnesota, prior to 1928, six cases were reported; in 1928, twelve cases; 1929, forty-one, and in 1930, sixty-two. This year, up to the present time (March, 1931) seven cases have been reported and verified by positive blood agglutinations at the State Board of Public Health. Thus, the frequency of the disease is becoming more striking, and at a recent meeting of the Health Section of the League of Nations it was stated that undulant fever is the most important problem facing public health workers at the present time.

ETIOLOGY

In December 1886, Colonel Bruce[1] observed minute organisms in a spleen from a patient who had died of undulant fever. A year later he cultivated an organism which he showed to be the etiologic agent of the disease. The name "micrococcus melitensis" was adopted. Soon after it was pointed out that bacillary forms, as well as coccoid forms, occurred.

Ten years later (1897) Bang[2] described an organism causing contagious abortion in animals. He noticed that these organisms, when appearing in infected tissues, often appeared coccoid in shape. After isolation, however, he determined he was dealing with a bacillus and the term "bacillus abortus" was accepted.

For twenty years these organisms were differently named and even considered by bacteriologists to be unrelated. In 1918 Alice Evans[3] showed that these two organisms were morphologically, culturally and biochemically indistinguishable, and serologically closely related. A new classification was therefore necessary. Meyer[4] proposed the name "Brucella," in honor of Bruce; thus, the term "Brucella melitensis." Previous distinction had been maintained by the recognition of the different varieties. Micrococcus melitensis became Brucella melitensis (variety melitensis) and Brucella abortus, variety abortus. The latter type is divided into the porcine and bovine types.

The natural habitat of the melitensis type is in the goat. Texas, New Mexico and Arizona are the only states in the Union in which the melitensis is of much importance.

A survey of the literature shows that the abortus type is found in practically all parts of the world.

Morphologically, these organisms are small, non-encapsulated, non-motile and gram-negative. Coccoid and bacillary forms occur as well as intermediary oval shapes. Culturally, growth takes place slowly in liquid medium, rarely being visible before the fourth day, and occasionally not until the tenth day. On agar, the colonies on first subculture usually make their appearance in from 48 to 72 hours and slowly increase in size. They are non-acid, non-gas forming. By simple agglutination procedures the strains cannot be differentiated.

MODE OF TRANSMISSION

Formerly it was supposed that undulant fever was transmitted solely through the use of milk. However, clinicians who have had experience with a large number of cases found they could not account for all their cases as being due to ingestion of milk. The incidence among doctors and technicians working in laboratories with the organism soon became striking. Likewise, the incidence among veterinarians and farmers increased. Dr. Bonynge[5] reported the disease in an eleven months old infant who had been fed on certified milk. Three other children in the same family, using the same milk, did not have the disease. Either this was a congenital case or contact. Hardy[6] proved that the disease was transmitted by contact. He took a series of guinea pigs, and in one set he shaved the hair and abraided the skin, then applied the organisms. In this group 100 per cent of the pigs developed undulant fever. In a second series the guinea pigs were only shaved and the organism applied. Here 90 per cent of the pigs developed undulant fever. In the third series the hair was only clipped and the organisms applied. Seventy-eight per cent developed undulant fever. In the fourth series the organisms were fed to the animals; only 22 per cent developed the disease. Dr. Carpenter[7] isolated Brucella abortus from tonsils and lymph nodes. He also found that these tissues remained infected longest.

---

*Presented before the Staff of The Charles T. Miller Hospital, Saint Paul, March 3, 1931.

In cattle "contagious abortion" is a misnomer. The disease frequently affects non-pregnant cows, and the disease commonly affects bulls. Calves possess a relative immunity. Ninety per cent of the herds of Connecticut and 86 per cent of the herds of Pennsylvania are said to be infected. Hirschboeck[8] reports that out of 16,319 cattle tested at the University of Minnesota farm school, 4,938 gave strongly positive serological reactions, and 726 reacted in dilution below 1:100 Simpson[9] in examining a group of cattle found 86 per cent of the cows and 100 per cent of the bulls infected. Eight calves gave negative results. It is the belief among veterinarians that the disease may be transmitted to cows by the bull through the seminal route. Organisms have been found in bovine placenta and also in fetuses. Simpson[10] found three cases in men who first went to a genito-urinary clinic, thinking they had Neisserian infections. Sera agglutination was positive. In one case Brucella abortus was recovered from a sinus tract extending through the scrotal wall.

It is highly probable then that the ingestion of milk is not the only source of transmission.

LABORATORY FINDINGS

The most reliable diagnosis of undulant fever is made by the agglutination test, or by the isolation of the organism. Not all cases of proven undulant fever show a positive agglutination. Carpenter and Boak[7] found this discrepancy in 6 per cent of their cases. Once present, however, it remains positive for two to ten years. Frequently sera show a pre-zone; this means that in the lower dilutions sera will not show agglutination, while perfect agglutination will be found in dilution of 1:400 or above. Thus, the importance of running a series of dilutions.

There is some doubt as to the value of the lower titers. However, the consensus of opinion is that in cases with positive agglutinations of 1:80 the definite clinical picture of undulant fever is generally present. Cases with dilutions of 1:40 are usually considered negative, but the physician must consider his case very carefully and be guarded in his statements before giving his opinion, since it is the rule that the titer falls as the patient gets farther along in convalescence. The lower dilutions without symptoms may be an indication of past infection. In those cases of clinical undulant fever which do not show positive agglutination, other laboratory methods of ruling out the disease are available. In this respect recovery of the organism from the blood stream is the next best method. The technic, however, is still in the experimental stage, but promises to be of considerable value. Hardy[11] was able to get 22 positive blood cultures in his series.

Kristensen reported 65 per cent positive blood cultures in his series. Baker[12] reported a case of intermittent hydrarthrosis in which he was able to demonstrate the organisms in both the aspirated fluid and blood culture. Amoss[13] isolated the organism from the stools in a clinically and serologically proven case by agglutination and planting. The complement fixation test has no advantage over the agglutination test and is not as reliable. Guinea pigs and mice are the best laboratory animals for injection. The value of the skin test is also in the experimental stage, but those who are using it feel that it has a distinct diagnostic value. In mild cases the hemoglobin and red blood cell count are not materially changed. A leukopenia with a relative lymphocytosis is a usual finding at some stage of the disease. Carpenter and Boak[7] found on the average a white count of 4,200, with a lymphocytosis as high as 48 per cent. A high proportion of monocytes are often noted, and a polymorphonuclear leukocytosis is often noted at the onset of the acute septic forms.

CLINICAL FEATURES OF THE DISEASE

The incubation period has not been definitely determined. In accidental laboratory infections it varied from 7 to 12 days. The general picture of the disease is one of a bacteremia. Consequently, no clear-cut picture can be made. Giordona[14] and his workers classify the disease as acute and chronic forms, and then divide them into several types, such as septic, neurologic, visceral, glandular and arthritic. Hardy[11] in his series recorded the following nineteen complaints: Weakness, sweating, feverishness, chilliness, rigor, general aches, headache, backache, pain in back of neck, arthralgia, abdominal pain, anorexia, nausea and vomiting, constipation, cough, sore throat, insomnia and loss of weight.

The temperature is surprisingly high in relation to the pulse, appearance and general condition. Patients with fevers of 101° and 104° often have pulses of only 90 and 100, with normal respirations. Furthermore, many patients do not look at all ill in comparison to the temperature. As a matter of fact only when having a chill will they have any discomfort, and during the inter-chill period they will feel well and not appear ill, although the temperatures may be 101° or more. The fever is usually not the true undulating type as one would expect, but more often of the type one sees in tuberculosis; i.e., high in the afternoon with morning remission. In others it may be of the continuous type. Loss of weight is fairly constant, and may be from 10 to 50 pounds.

Very often the symptoms are quite like those of an upper respiratory infection. In the last three patients seen, two had been previously diagnosed as grippe because of sore throats, slight cough, fever and backache. The third patient made her own diagnosis of grippe. However, the presence of a continual fever with chills, sweats and general body aches should put the attending physician on guard for undulant fever.

One would think that in women with repeated abortions, without findings to account for them, undulant fever would be a safe bet. In not a few cases undulant fever has been found, but in the vast majority it could not be diagnosed. Harbinson,[15] in twenty-five such cases, could only find two showing positive agglutination and then only in low dilutions. Carpenter[16] studied blood from twenty-eight women who aborted and also studied twenty-seven fetuses and twenty-eight placentas. In all of these he found not a single case of undulant fever. Simpson,[17] on the other hand, found positive agglutination ranging from 1:80 to 1:329 in five women who aborted repeatedly. Cornell in his series found five positive blood sera, but each patient went on to normal delivery.

On physical examination one may find very few changes. As said before, the appearance of the patient may not at all be any indication of the severity of the disease. Enlargement of the spleen is supposed to be one of the fairly constant findings. Hardy[11] found this organ enlarged only thirty-seven times in 125 cases. In thirty-five cases Giordono found only two with enlarged spleens. Arthritis with swelling and tenderness of joints may be present. Redness, however, is usually absent. Evidence of orchitis, epididymitis, and oöphoritis may be present. In short, the disease may resemble almost anything, and after the diseases that usually cause a given condition have been ruled out, undulant fever should be considered.

PROGNOSIS

The prognosis is good. Hardy[11] reported two deaths due to endocarditis. However, there had been a pre-existing vegetative endocarditis and undulant fever appeared to have lighted up the process, as no organisms were found in the fresh vegetation. Cases of acute endocarditis going on to fatal termination have been reported due to the disease. Harbinson[15] reported one death with necropsy findings. Here there was evidence of a general septicemia. The mortality ranges from 2 to 8 per cent. The degree of titer is no indication of the severity of the disease. Mild cases may have a titer of 1:1280, while very severe cases only 1:80. Duration of the disease varies from four weeks to eight or nine months.

THERAPY

The numerous recommended forms of treatment is an indication of their value. Different dyes, vaccines and serums have been used, some getting results in one case and absolutely failing in another. At present the consensus of opinion seems to be that reliance must be placed for the most part on symptomatic treatment as in certain other infectious diseases.

CASE REPORTS

Case 1.—Mrs. H. M., a housewife, thirty-five years of age, entered the hospital on August 4, 1928. She had been well up to two months prior to admission, when, without any apparent reason, she began to have chills, followed by fever and moderate sweats. With the exception of discomfort during the chills the patient did not have many complaints. The daily chills occurred for about ten days, and then she felt well. Two weeks before hospitalization the chills recurred and kept up until admission.

The family history was not important. In her past history it was brought out that the patient lived in a Saint Paul suburb, and drank milk freely. She had gone through a normal pregnancy and delivered at term three months previously.

Physical examination was negative except for a palpable spleen. On admission her temperature was 104.2 and pulse, 110. During the first part of the stay in the hospital her temperature varied between 99 and 104. During the latter part of the stay her temperature varied from 98.6 in the morning to 102 in the evening. The patient was given a course of acriflavin without much change in the course of her disease.

The urine was negative. On admission the leukocyte count was 6,000; polymorphonuclears, 45 per cent; lymphocytes, 54 per cent; and eosinophiles, 1 per cent. At time of discharge, examination showed the hemoglobin to be 69 per cent; R. B. C., 3,980,000; leukocytes, 4,850; polymorphonuclears, 41 per cent; lymphocytes, 58 per cent, and eosinophiles, 1 per cent. Agglutination for Brucella abortus, 1:3,480. Blood culture was negative. X-ray films of the chest were also negative.

On leaving the hospital the patient had very few complaints, but fluctuation in temperature persisted.

The herd from which the patient obtained milk was examined and a number of cattle were found to show an abortus infection.

Case 2.—Miss H. S., a housemaid, aged 25, was admitted to the hospital on January 28, 1931. She had become ill one and a half weeks before Christmas, at which time she complained of weakness and fatigue, chills and fever. The physician who attended her ordered her to bed, diagnosing her condition as an upper respiratory infection, probably influenza. Although she remained in bed for one week her cough continued. Shortly afterward the chills and sweats returned, and the cough became worse, so she was sent into the hospital, where it was noted that she had nocturnal chills followed by sweats, always occurring between two and three o'clock in the morning. She also complained of some joint aches. However, at no time did the patient appear ill, and she really had few complaints. The temperature had its daily fluctuations—in the morning usually normal, and at night going up as high as 102°; and the pulse fluctuated directly as the temperature, reaching the rate of 120 per minute.

Physical examination was negative except that the spleen was palpable, but not tender.

Urine showed a trace of albumin constantly; the leukocytes in the uncatheterized specimens ranged from 0 to 10 or 15 per high powered field. On admission the leukocytes were 6,750; polymorphonuclears, 57 per cent; lymphocytes, 39 per cent; large mononuclears, 3 per cent; eosinophiles, 1 per cent; hemoglobin, 66 per cent, and red blood cells, 4,360,000. Leukopenia had been persistent and a relative lymphocytosis developed. Later on, the white count was 4,650; polymorphonuclears, 46 per cent; large mononuclears, 4 per cent, and eosinophiles, 2 per cent. The red blood cells were normal. At one time (about February 16) the large mononuclears reached 11 per cent. Sputa had been negative for tubercle bacillus. On January 31, 1931, Brucella melitensis (abortus) was positive in 1:1,280; the Widal negative.

On February 26 the blood was again examined. At this time positive agglutination for bacillus abortus was present in dilutions of 1:640. Also, at this time the Widal test was positive.

The patient stated that when she was two or three years of age her family had typhoid fever, although she was under the impression that she did not have it, nor did she know whether or not she was immunized against typhoid. At any rate, this present condition was not the clinical picture of typhoid. There have been reported cases of cross agglutination between bacillus abortus and bacterium tularense, but the writer was unable to find any literature showing such a cross agglutination as shown in this case. However, every attempt was made to rule out evidence of typhoid, and, except for the Widal, other confirming tests for typhoid, such as examination of the urine and stools for typhoid bacillus were negative.

X-rays of the chest were negative, and the nose and throat examination was negative.

In the beginning, the patient was given iodides intravenously, but she developed an allergic reaction, so this was discontinued. A series of acriflavine was contemplated, but because of her reaction, and because acriflavine usually caused a slight reaction, it was not given. Thus, treatment was entirely symptomatic.

There was very little change in the patient's condition during the first three weeks in the hospital. However, from that time until date of discharge there was a steady improvement in her general condition, and the evening exacerbation of temperature became less, so that for the last ten days of her hospital stay the temperature was never above 98.6°. The spleen was no longer palpable, and all the subjective symptoms disappeared.

The patient's home was in the country. It was noteworthy that those with whom she lived (in the country) had similar colds and the patient suspected she contracted her cold from some one of them. No investigation of those associates was made. It was also learned that while in the country the patient drank a great deal of raw milk, and for that reason the herd of cattle which supplied the family's milk was reported to the State Board of Health for investigation.

Case 3.—Mr. S. O., a male office worker, aged 30, was seen at the Clinic on November 3, 1930, complaining of a cough, night sweats, aching in the muscles of the chest and shoulders. He said he had had, just three weeks previous, what a doctor had called the "grippe." During investigation it was learned that he did not use milk to any extent.

Examination showed his temperature to be 101° and his pulse rate 76. His throat was clear; his heart, negative. The lungs showed occasional crackles in the second left intercostal space at the sternal border, but X-rays of the chest were negative. The spleen was slightly enlarged.

The urine was negative. The blood showed 80 per cent hemoglobin; 4,600,000 red blood cells; 10,100 leukocytes; 44 per cent polymorphonuclears; 53 per cent small lymphocytes, with 1 per cent large mononuclears, 1 per cent eosinophils and 1 per cent non-filamented. Red blood cells were normal. Brucella melitensis agglutination revealed complete agglutination in 1:160 and partial in 1:640. The Widal test was negative.

This patient lived out of the city and no further record of his progress was maintained.

Case 4.—G. A., a male, twenty-eight years of age, a restaurant cook, was first seen at the Clinic on November 22, 1930, when he complained of weakness, backache, loss of appetite and constipation. His family and past histories were negative. He stated that he was married and that his wife had had three full term pregnancies, with no history of miscarriage.

Two weeks previous, the patient contracted an upper respiratory infection ("nose and head stuffed up"), with a sore throat, but no cough. He went to bed for one day and then returned to work, but he continued to have the above mentioned complaints. Before his illness his weight was 145 pounds and on the first visit to the office it was 133.5 pounds.

Examination showed his blood pressure to be 110/75; pulse rate, 85; and the morning temperature, 99.4°. A few days later the morning temperature was still 99.4°. General physical examination was negative except for a questionably enlarged spleen. Nose and throat examination showed definite chronic tonsillitis.

The urine was negative except for the presence of bile. Blood examination showed 82 per cent hemoglobin; 4,690,000 red blood cells; 4,800 leukocytes; 40 per cent polymorphonuclears; 56 per cent lymphocytes, and 4 per cent large mononuclears. The Wassermann test was negative.

The patient was put on salicylates and on December 30, 1930, he was much improved. His temperature was 97.6°. Urine showed positive bile; blood showed 3,480 leukocytes, with 26.4 per cent polymorphonuclears, 66.8 per cent lymphocytes and 5.2 per cent mononuclears. At this examination the spleen was definitely palpable. Agglutination for Brucella melitensis was 1:640.

When last seen at the Clinic the patient was feeling so well that he did not want to return for subsequent examination; hence, his exact condition at present is not known.

SUMMARY

1. Four cases of undulant fever are reported.
2. The disease is more prevalent than is suspected.
3. In any disease of obscure nature with prolonged fever, undulant fever should be ruled out.
4. The disease is probably transmitted by contact as well as by ingestion of milk.
5. A leukopenia with a relative lymphocytosis seems to be a constant blood finding at some stage of the disease.
6. The use of pasteurized milk will help to prevent the spread of the disease.
7. A case of undulant fever is reported, in which a Widal test, three weeks after onset of disease, was negative, but when reexamined at the end of seven weeks was found to be positive. Other tests were made to confirm a diagnosis of typhoid fever, but they were all negative, so the positive Widal must have been due to some peculiar form of cross agglutination.
8. Much remains to be discovered in the line of therapy. Although vaccines and various dyes have been helpful in certain cases, symptomatic treatment at the present time is the favored line of therapy.
9. A review of the literature on undulant fever is presented.

NOTE: Since the writing of this paper there has appeared in the literature a case of undulant fever also showing a positive Widal but without any clinical evidence of typhoid fever. Schilling et al. in the Journal of the American Medical Association for June 6, 1931, reports such a case and ascribes this Hektoen phenomenon to the possibility that the undulant fever infection stimulated not only the specific agglutinins but also the agglutinins for typhoid fever. Gilbert and Colman, in the Journal of Infectious Diseases for April, 1930, have discussed the Hektoen phenomenon in detail. With the possibility, therefore, of both a positive Widal and a positive agglutination for undulant fever being present in the same blood a final diagnosis can only be made by means of further laboratory studies, especially by the isolation of typhoid organisms in the stool or urine.

REFERENCES

1. Bruce, D.: Practitioner, 39:161, 1887.
2. Bang, B.: Jour. Comp. Path. and Therapy., 10:125, 1897.
3. Evans, Alice C.: Jour. Inf. Dis., 22:580, (June) 1918.
4. Meyer, K. F., and Shaw, E. B.: Jour. Inf. Dis., 27:173, (Sept.) 1920.
5. Bonynge, C. W.: Jour. Lab. and Clin. Med., 15:458, (Feb.) 1930.
6. Hardy, A. V.: Jour. Lab. and Clin. Med., 15:458, (Feb.) 1930.
7. Carpenter, C. M., and Boak, R. A.: Jour. Lab. and Clin. Med., 15:437, (Feb.) 1930.
8. Hirschboeck, F. J.: Minn. Med., 12:590, (Feb.) 1930.
9. Simpson, W. M.: Ann. Int. Med., 4:238, (Sept.) 1930.
10 Simpson, W. M.: Jour. Lab. and Clin. Med., 15: 456, (Feb.) 1930.
11. Hardy, A. V.: Jour. Am. Med. Assn., 92:853, (March 16) 1929.
12. Baker, B. M. (Jr): Arch. Int. Med., 44:128, (July) 1929.
13. Amoss, H. L., and Poston, M. A.: Jour. Am. Med. Assn., 93:170, (July 20) 1929.
14. Giordono, A. S., and Sensenich, R. L.; Jour. Lab. and Clin. Med. 15:421, (Feb.) 1930.
15. Harbinson, J. E.: Ann. Int. Med., 4:484, (Nov.) 1930.
16. Carpenter, C. M.: Report of the N. Y. State Vet. College, Cornell University, 19:45-47, 1926-27.
17. Simpson, W. M., and Frazier, E.: Jour. Am. Med. Assn., 93:1958, 1929.
18. Cornell, E. L., and DeYoung, C. R.: Am. Jour. Obst. and Gyn., 18:840, 1929.

AGRANULOCYTIC ANGINA*

REPORT OF A CASE

Rudolph C. Logefeil, M.D., M.S.
Minneapolis

THE first cases of agranulocytosis in connection with infection were reported in 1904 by Schwartz,[1] and in 1907 by Turk.[2] From that time until 1922 numerous case reports have appeared in the literature. In that year Schultz[3] described a group of cases under the name of Agranulocytosis, which he thought might be a new disease entity. In reviewing these and other cases, Friedemann[4] in 1923 suggested the name Agranulocytic Angina. The syndrome was characterized by a sudden onset of sore throat, fever, chills and prostration. Later the angina developed into a bleeding gangrenous ulceration of the mouth and throat with a membrane often simulating diphtheria. Enlargement of the liver and spleen, and occasionally some of the lymph glands occurs, all terminating in a fatal pneumonia. Marked leukopenia, sometimes below 1,000, with great diminution or absence of granular leukocytes and relative lymphocytosis, was the characteristic blood picture and source of its name. Since Schultz's article appeared, over seventy-five cases have been reported, some of which showed additional symptoms of ecchymosis, secondary anemia and ulcerating necrosis of esophagus, intestines and genitals, jaundice, coryza, mouth and labial ulcers, variously located abscesses, painful swollen joints, dental caries and root abscesses, mental torpor, etc. Leukopenia and angina are the only findings common to all cases.

The disease has occurred most frequently in middle-aged women. Although the onset is sudden and usually affects those in good health, it may occur in the persons who have been ill sometime with a chronic disease (Klein).[5] The mortality is extremely high, although a few cases with recovery have been reported. When this occurs, the blood picture rapidly returns to normal. This is often followed in a short time by relapse, ending in death. Harkins[6] has collected reports of about 150 cases from the literature, 82 per cent of which ended fatally.

After elimination of the doubtful cases, Hueber[7] finds seventy-nine cases of undoubted agranulocytosis in the literature, sixteen of which were cured. The histories obtained in twenty-five cases show previous severe infectious processes. In fifteen other cases, there had been a feeling of sickness from one to twelve months, with vague symptoms and no evident cause. In twenty-eight cases the bacteriologic examination revealed streptococci, staphylococci, pneumococci and bacillus coli. In the other cases the pathologic-anatomical findings indicate an infectious process, although the bacteriologic examinations were negative.

Autopsy findings were reported in quite a number of the cases, and vary somewhat. Turk's case[2] showed a bone marrow with an occasional hemorrhagic area and few granulocytes. In Stursberg's case,[8] the long bones showed fatty marrow, while Blumer[9] reports a hyperplastic bone marrow. Hueber[7] states that "the findings in the bone marrow and the negative oxidase reaction of the leukocytes indicated a paralysis of the bone marrow," in his case. Thus, a hyperplastic red bone marrow with normal function except for making granulocytes is characteristic.

In several instances marrow was removed from the sternum at various periods of the disease and showed a decrease in the number of cells, especially in the granulocytic elements, during the height of the disease. The erythrocytic part of the bone marrow seemed unaffected in most of the cases. In those instances in which the spleen or lymph glands were enlarged, the notable finding was *no* evidence of leukemia. Many of the cases showed septic foci in various places such as in the gallbladder, a lung abscess, perityphlitis, follicular abscess in the colon, duodenum, liver and rectum, abscessed tooth, and abscessed lymph nodes.

The blood picture is one of a marked leukopenia with an abscence or marked diminution of the polymorphonuclear leukocytes. The lymphocytes are relatively increased up to 100 per cent.

---

*Read before the Minnesota Society of Internal Medicine, Rochester, Minn., Nov. 10, 1930.

Schultz[3] states in his original report that there ire no specific pathological cells. Very little is said in the various case reports about the morphological characteristics of the blood cells. My own case showed a marked relative lymphocyosis, but the remaining granulocytes and the ymphocytes showed no special morphological changes. Some of the cases reported (Paroulek,[10] Jedlicka[11]) showed immature granular eukocytes and undifferentiated embryonic mononuclear cells. I found these cases also associated with severe secondary anemia, clinical hemorrhagic phenomena and severe sepsis, and believe hey are not true cases of agranulocytic angina, but a type of agranulomyeloblastic septicemia. Most cases only showed a slight secondary anemia and a normal plaetelet count. The funcions of the bone marrow were normal except in he manufacture of granulocytes. Roberts[12] reports normoblasts and megakaryocytes present in heir case, but myelocytes and granulocytes are bsent or nearly absent.

Aside from the blood picture, other laboratory ests are variable and of little help in diagnosis. Throat cultures, sputum, and sometimes blood ultures have shown streptococcus hemolyticus n many of the cases. The question of whether his is the primary cause or only a secondary nvader will be discussed later. Some cases howed staphylococcus aureus abscesses. Occaionally pneumococci and micrococci were culured from the tonsillar fossæ. Absence of Vinent's spirilla and fusiform bacillus was noticeble.

I offer the following case report, not because t shows anything especially striking, but rather hat I feel all cases of agranulocytic angina hould be reported, as an aid to help clear up n apparently hazy situation.

CASE REPORT

H. W., a graduate nurse, aged 29, entered Fairview Hospital January 14, 1930. Her chief complaint on enrance was sore throat, fever and general malaise.

About one week before admittance she had had an bscessed tooth lanced. At this time her throat began o get sore. She developed a fever of 103 degrees, with marked general weakness. Difficulty in swallowing deeloped the next day. The angina and general weakess increased and the fever continued, and on January 3 she was advised by her physician to go to the hospital. At this time he found her with a high fever, marked redness and edema of the throat and soft palate, a membrane in the right tonsil fossa, a dry tongue and a general appearance of severe toxicity. There was marked swelling and redness at the point where the abscessed tooth had been lanced.

The only thing of interest in the past history was that while doing nursing at the Fort Snelling Government Hospital about one year before the present illness, she had been severely ill with angina and high fever, and showed at that time a marked leukopenia and relative lymphocytosis. She became increasingly ill for a week and then gradually improved and was back at work again in about a month. She had had measles, mumps, pertussis, inflammatory rheumatism in 1922, tonsillectomy and appendectomy in 1918.

The family history was without significance. Her mother was living and well at the age of 77. Her father had died of carcinoma, and one brother of pulmonary tuberculosis.

On entrance to the hospital the temperature was 101.2 F., pulse 110, and respiration 20 to the minute. Physical examination at this time by her attending physicians showed about the same findings as previously recorded, except, in addition, a number of coarse moist râles scattered throughout both lungs, especially in the lower left lobe. Her general condition was worse and she now had an anxious expression on the face.

The urine had a specific gravity of 1,013, showed a few granular casts but was otherwise normal. The w.b.c. numbered 4,000 with 6 per cent granulocytes, 85 per cent small lymphocytes and 9 per cent large lymphocytes. Morphology of cells was normal. A smear from the throat on this day showed streptococcus hemolyticus. X-ray of the lungs showed a pneumonic consolidation in the lower left lobe. On January 15 her condition was about the same and 5,000 units of diphtheria antitoxin were given.

On January 16 there was clinical evidence of areas of consolidation in both lower lobes, and X-ray showed an extensive pneumonic process in the lower left lung, and a beginning similar condition in the lower right, with a temperature of 104.2, pulse of 128, and respiration 32. The leukocyte count on this day was 3,500 with 26 per cent granulocytes and 74 per cent lymphocytes. She complained of sharp, stabbing pains over the heart, but that organ seemed to be normal. Streptococcus Immunogen (P. D. & Co.) in 0.5 c.c. doses was given and repeated daily thereafter. Solvochin, 2 c.c., was also given intramuscularly.

I saw the patient first on January 17, being called in consultation. I found her extremely ill, with flushed face, pneumonic type of dyspnea, dry tongue, and very toxic. There was a very foul odor to the breath. Her throat was red, swollen and edematous with a greenish-gray-yellow membrane extending from right tonsillar fossa up onto the soft palate with ulceration along its edge. There was definite enlargement of the lymphatic glands in the anterior neck. The lips showed herpes and the lungs a diffuse, bilateral bronchopneumonia. She was bright mentally. Otherwise the examination was negative. Temperature 103.8, pulse 124. respiration 32. The blood picture was normal except the leukocytes were 2,500, 20 per cent granulocytes and 80 per cent lymphocytes. The morphology of cells was normal.

From this time until the date of her death on January 26, her general condition continued to grow worse. The angina increased in severity. On January 20 the whole soft palate looked gangrenous and sloughed off a few days later. On January 24 she became aphonic. Cultures of the throat showed Vincent's spirilla in small numbers. The pneumonic process seemed to clear in some areas, but increased in others. The temperature fluctuated daily between 101 and 104 degrees, the pulse 105 to 124, and respiration 24 to 34. The fluid intake was kept up to 4,000-5,000 daily, with a urinary output of about one-half the intake. The urine at no time showed anything more than a few granular casts. Most of the specimens were entirely clear. Three blood cultures were negative. Daily blood examinations were made which showed a moderate secondary anemia and a persistent leukopenia. The lowest count was on January 18, 1,550, when the patient seemed slightly improved. The following daily counts were: 2,400, 2,500, 3,900, 3,950, and 2,900 (the day before death). The relation of granulocytes to lymphocytes varied. The extremes were 6 per cent granulocytes, 92 per cent lymphocytes, and 26 per cent granulocytes with 7 per cent lymphocytes. There seemed to be no special relationship between the degree of leukopenia and the percentage of granulocytes. There seemed to be no definite relationship between the degree of leukopenia and the general condition of the patient. The leukocytes increased from 2,500 to 3,900 after a direct transfusion of 300 c.c. of whole blood on January 21. There was also slight improvement in the general condition. Another transfusion of 380 c.c. of whole blood was given on January 26, the day of death. Other treatment consisted chiefly in keeping up a high fluid intake, narcotics for pain and rest, diathermy daily to pneumonic areas, citrocarbonate and digitalis, with no definite benefit noted.

Although other conditions, chiefly sepsis, may be accompanied by leukopenia, I feel that this case corresponds closely enough to those described by Schultz to be considered a true case of agranulocytic angina.

Blumer[9] has recently reported a case of sepsis accompanied by an agranulocytic blood picture in which he believes the sepsis is primary and the blood picture a secondary manifestation. This case, however, did not show primarily the typical mucous membrane lesion (the angina).

Schwartz's[1] case of genito-urinary infection from a ruptured renal or perinephritic abscess showed a terminal gingivitis, enlarged submaxillary glands, and a leukopenia of 600 with no granulocytes, but there was no angina.

Turk's[2] case showed a leukopenia of 940 with 93.5 per cent lymphocytes but the clinical picture was quite typical of an acute endocarditis, which was proved by autopsy, and due to staphylococcus.

Cases reported by Stursberg,[8] Marchand[13] and McAlpin[14] appeared clinically to be types of lymphatic leukemia with varying grades of leukopenia and high relative lymphocytosis, but autopsy showed them to be various forms of sepsis with no evidence of leukemia.

Klein[5] reported a case of chronic, multiple arthritis accompanied by gangrenous stomatitis and terminal pneumonia, with a severe leukopenia (175) and no granulocytes found in 200 cells counted.

Hueber[7] in 1929 reported a case of chronic sepsis with severe phlegmonous necrosing tonsillitis and follicular purulent epityphlitis in the appendicular stump after appendectomy, follicular abscesses in the duodenum, colon and rectum, sporadic embolic abscesses in all of the pulmonary sections, tumor of the spleen, and erythroblastic bone marrow, which showed the typical leukopenia and agranulocytosis.

Other cases in the literature could be cited, but these are sufficient to indicate that there are certain individuals whose bone marrow reacts to bacterial infection differently than usual. Many of these cases are probably not true examples of agranulocytic angina.

In Roberts' case[12] the same patient had an agranulocytic response to one type of infection and granulocytic to another.

Paroulek[10] reports an interesting case showing two attacks of septicemia from different causes but with the same blood picture in both cases: leukopenia with disappearance of mature forms from the peripheral blood and appearance of young cells (myeloblasts) showing complete exhaustion of the bone marrow.

The main question is this: is there always first a sepsis whose toxins exhaust or paralyze the manufacturing plant of the granulocytes in the bone marrow with resulting leukopenia, decreased resistance and death, or is the agranulocytic factor in the bone marrow primary and the bacterial invasion and resulting sepsis secondary? If the latter is true, then agranulocytic angina is a separate disease entity with its pathological origin in the bone marrow.

There are conditions of the bone marrow in which all its functions are depressed, such as aplastic anemia. So-called aleukemic type of lymphatic leukemia and aplastic anemia may develop terminal infections, especially of the mouth and throat, and show agranulocytosis. At this stage they would be very difficult to distinguish clinically from true agranulocytic angina. But, surely in the case of the former, the depression of the bone marrow cannot be physiological but rather the resulting action of some toxin. It is well known that toxic chemical substances such as benzol, thorium, X-ray and others damage or paralyze the regenerating powers of the bone marrow. Farley[15] reported seven cases of depressed bone marrow function resulting from arsphenamin treatments. Wheelihan[16] found an agranulocytic aplasia of the bone marrow following the use of inorganic arsenic in a nine year old child who recovered.

So, it is easy to conceive that toxins resulting from sepsis may in acute cases paralyze, or in chronic or repeated acute attacks, exhaust the regenerative powers of the bone marrow. All the functions, or part only, as the formation of granulocytes, may be affected. Where the excessive virulence paralyzes the creative capacity of the bone marrow, no new cells are passed into the blood. The proportion of these cells in the peripheral blood decreases constantly until there is an extreme leukopenia. If the infection is chronic, it irritates the bone marrow constantly until its creative capacity slowly becomes exhausted, which leads to younger and more immature cells passing into the blood. True agranulocytic angina probably represents the first possibility, namely, acute paralysis of the granulocytic factory of the bone marrow by a specific virus, or a non-specific one, or an unaccountable physiological factor, which completely stops the reaction of the bone marrow and possibly also destroys the cells in the peripheral blood.

Roberts' case[12] is pretty strong evidence that the bone marrow change is primary and precedes the sepsis. There was reduction of the granulocytes to 10 per cent four days before the clinical onset and complete disappearance of the granulocytes from the blood stream two days before the clinical onset. They conclude from this that the disease exists in the bone marrow before it appears in the blood stream, and in the blood stream before it appears clinically. In other words, the disease has three onsets: a marrow onset, a blood stream onset, and a clinical onset. A careful study of their case would certainly indicate that this is true, and affords evidence that the marrow loses its power to make granulocytes for some days before the development of sepsis.

Their patient had two separate attacks about two months apart with daily blood studies which gave them a fine opportunity to study the blood picture between and during attacks. Recovery from the first attack is attributed to the quick onset of sepsis due to the invasion of streptococcus hemolyticus, and resultant awakening of the myelocytic activity of the marrow. It appears from this that secondary bacterial invasion may act as a stimulator rather than a depressor of agranulocytic bone marrow function. Their case also illustrates the fact that great decrease or absence of granulocytes may alone result in serious mental and physical collapse with loss of the natural immunity against infection.

Although most cases succumb to the initial attack, remissions of months or years may occur, with recurrent attacks as illustrated by the cases of Roberts,[12] Rutledge,[17] and the author.

Transfusions seem to offer the most help, but the production of an abscess may prove to be a means of reawakening bone marrow activity. Roentgen ray of the long bones and protein shock therapy have been advocated.

CONCLUSIONS

1. Agranulocytic angina or true agranulocytosis may prove to be a definite disease entity with primary pathology in the bone marrow. Another such case has been reported.

2. Agranulocytosis may be caused by or occur with other conditions such as severe acute sepsis, some chronic infections, poisoning from chemical substances, aplastic anemias, and aleukemic blood conditions.

3. *Absence* of morphological changes in the blood cells, immature leukocytes, severe secondary anemia, and hemorrhagic diathesis, with the *presence* of severe ulcerating angina, prostration, and terminal pneumonia are characteristic of true agranulocytic angina and will help to differentiate it from similar conditions.

1111 Nicollet Ave.

BIBLIOGRAPHY

1. Schwartz, E.: Wien. klin. Wchnschr., 17:806, 1904.
2. Turk, W.: Wien. klin. Wchnschr., 20:157, 1907.
3. Schultz, W.: Deutsche med. Wchnschr., 48:1495, 1922.

4. Friedemann, H.: Med. Klin., 19:1357, 1923.
5. Klein, Thomas: Agranulocytic angina, Med. Clin. No. Am., 12:1057 (Jan.), 1929.
6. Harkins, H. N.: Granulocytopenia and agranulocytic angina with recovery, Arch. Int. Med., to be published.
7. Hueber, Walther: Contribution to the problem of agranulocytoses, Munch. med. Wchnschr., 76:881 (May 24), 1929.
8. Stursberg, H.: Med. Klin, 8:520, 1912.
9. Blumer, Geo.: The agranulocytic blood picture in conditions other than angina, Am. Jour. Med. Sci., 179:9 (Jan.), 1930.
10. Paroulek, Jan.: Agranulomyeloblastic septicemia cured by repeated transfusions of blood. Arch. d. mal. du coeur, 20:648, 1927.
11. Jedlicka: Quoted by Paroulek.
12. Roberts, Stewart R., and Kracke, Roy A.: Agranulocytosis: Report of a case, 95:780 (Sept.), 1930.
13. Marchand, F.: Deutsch. Arch. klin. Med., 110: 359, 1913.
14. McAlpin, K. R.: New York State Jour. Med., 28:1459, 1928.
15. Farley, David L.: Depressed bone-marrow function from the arsphenamins. Am. Jour. Med. Sci., 179:214 (Feb.), 1930.
16. Wheelihan, R. Y.: Granulocytic aplasia of the bone marrow following the use of arsenic. Am. Jour. Dis. Child., 35:1024, 1928.
17. Rutledge, B. H.: Hansen-Pruss, O. C., and Thayer, W. S.: Recurrent agranulocytosis, Bull. Johns Hopkins Hosp., 46:369 (June), 1930.

ELECTRIC BURNS AND SHOCK*

Robert F. McGandy, M.D., F.A.C.S.
Minneapolis

THE rapid development of industrial electricity has been accompanied by an increase in the number of accidents from electricity. This increase, on the other hand, has not paralleled the extensive use of electricity in the household. It has been estimated that 0.5 to 0.9 per cent of all accidents in industry are due to electricity. Power companies have taken care of the increased hazard by the use of safety devices and as a result we find that the vast majority of accidents are due to carelessness.

Contact with electricity either directly or indirectly can cause any of the following:

1. Electric burns of all degrees.
2. Electric shock.
3. Associated trauma such as fractures and wounds from falls, etc.
4. Complications in the form of paralyses either organic or functional.
5. Sequelæ such as scars, deformities, psychoses, neuroses and melancholia.
6. Death.

In the consideration of electric burns I am going to confine my statements to third degree burns, inasmuch as first and second degree burns, such as flash burns, produced as a rule by indirect contact, do not differ materially from similar burns produced by other means. Contact electric burns on the other hand differ from all other types of burns in several ways. First, the heat producing this type of burn is far more intense and as a rule is applied for a short period of time. The temperature of hot cast iron is about 2200°, whereas that of the electric arc is 5500 to 7000°. Second, the relation of the surface spread to the depth of the burn is usually the opposite of other types, namely, an electric contact burn is deep and not so extensive on the surface. A third degree fire burn for example has a widespread area of erythema, an intermediate circle of vesication and a central area of slough. All three zones are ill defined, merge into each other and are seldom very deep. A third degree metal burn is more circumscribed, having a narrow, peripheral ring of erythema and vesication and a fairly well defined central area of necrosis, almost invariably extending down to the subcutaneous tissue. The electric burn is sharply circumscribed and deep. A small burn may have only a blister which if removed and examined closely has a central white area of necrosis and a very narrow ring of hyperemia about it. Larger burns present a central excavated area which is dry, crisp, bloodless, deep and often charred. This central area is surrounded by a zone of pallor or white necrosis which in turn is surrounded by a narrow zone of hyperemia or edema.

Jaffe states that the effect of a current passing through the skin is twofold: First, in passing through the skin, the electric energy is transformed into heat which alters the skin structure producing the so-called "current marking" which he states is specific and of great diagnostic value. Second, free discharge causes the formation of electric sparks which produce burns of the third degree. We usually have a combination of electric burns and current markings. He describes these current markings as being round, oblong or linear, varying from a few millimeters to several centimeters in diameter. The area is slightly elevated and pale gray, grayish white, yellowish gray or yellow. The hair usually is unchanged and one can often see the imprint of the live wire causing the marking on it. In high tension accidents these markings are often obscured by the burns and are best seen after injury from lower voltages. The bullet wound appearance of some contacts is a typical current marking. It is a round hole extending sometimes to the bone and is the result of sudden formation of steam in the tissues which finds its way out under high pressure. Although these markings are frequent yet electrocutions have been observed without any external sign of injury. Histologically the picture is one of necrosis of all tissue involved in the burn, including at times bone. This necrosis is aseptic as a rule and takes place very slowly without pus formation. In the skin proper the corneal layer is compressed and homogeneous if carbonization has not taken place. Carbonization is usually present only at the positive pole. Elongation of the cells is also noted as is seen occasionally in cauterization. This may be due to drying. The so-called electric edema, which forms immediately, is thought to be due to venous thromboses or local paralysis of the blood vessels.

---

*Thesis read before the Minneapolis Surgical Society at its meeting of March 5, 1931.

Jellinek states that blood vessels become friable and brittle. The endothelium is changed and parietal thrombi are attached to the intima. Microscopically there is extensive destruction of the nuclei, especially in the media. Occlusion is common in small arteries. The progressive character of burns is explained by these alterations in the blood vessels at a distance from the site of the injury due to the fact that they are such good conductors.

A peculiar characteristic of these burns at times is their complete painlessness. I recently had a patient who lost one entire hand and had a deep exit burn involving the humerus on the other side and did not require a sedative of any kind. Another feature is the fact that they oftentimes remain unchanged in appearance for days and even weeks and have very little reaction on the surrounding tissue. Toxic absorption is absent. The patient's general health remains unchanged, even in the presence of large areas of decay. These burns are known to take three to five times as long to heal as other burns, yet they possess a remarkable tendency to heal. After a period of latency lasting days or weeks, the necrotic area, which produces little if any suppuration, drops away spontaneously or can be removed without causing any noticeable irritation or particular discomfort to the patient. I have personally removed necrotic fingers and in one instance a wrist without any complaint on the part of the patient and without anesthesia of any kind.

In addition to the usual treatment for third degree burns in general I feel that the local care of this type of burn should be conservative. Solutions and ointments which help dissolve or hasten the removal of the burn eschar are often used. Such solutions are dilute acetic acid, Dakin's solution, saturated solution of magnesium sulphate and twice normal saline. The latter two have of course no place in the treatment of extensive superficial burns but help separate the eschar from the underlying granulation tissue when used late. Some advocate making incisions in the charred skin in lattice-work fashion to hasten the chemical debridement and lessen the chances of absorption. Early surgery in this type of burn as a rule is contraindicated. During the first few days or weeks after an electrical accident we are unable to determine whether tissue which at first shows no sign of injury will continue to do so or whether necrosis may not set in later on. Thromboses have been found at great distances from the burn. Also, the extent of the destruction in the media of blood vessels leaving the intima intact, is difficult to determine. As a result the possibility of the ligature holding and the vessels tearing, thereby causing further hemorrhages, must be considered. Therefore, immediate surgery entails the sacrifice of larger portions of tissue than is necessary, or if too small an amount is removed a second operation is necessitated. Conservative therapy on the other hand compensates the patient for the long healing period by assuring him the best results and the best possible chance of returning to his work. I personally believe that most of these victims are better satisfied if they themselves can see the necessity of removing a portion of their anatomy.

The only indications for immediate surgical procedures are:

1. Lumbar puncture when there is an increased intracranial pressure.
2. Hemorrhage.
3. Need for amputation of a limb or part in exceptional cases.
4. Necessity for primary suture of tendons and nerves in rare instances.

Before considering the subject of electrical shock we should first give some attention to a few details which are of great importance in understanding the wide diversity of results from electrical accidents. There are many factors governing the flow of an electrical current through body tissues. These factors are always present whether the outcome is fatal or otherwise. They are:

1. Voltage and tension of the current.
2. Current flow or amperage.
3. Resistance of the body.
4. Duration of contact.
5. Unipolar or bipolar contact.
6. Current path through the body.
7. Condition of individual susceptibility at moment of contact.

Many authors distinguish between high and low tension currents. Urquhart places anything below 500 volts in one group while Jaffe places the high limit of current at 1,000. Anything above these is considered high tension. Low voltage deaths are common and many physicians forget that the ordinary household current can kill under proper circumstances. The greatest number of deaths occur apparently from contact with voltages between 220 and 1,100 or in the medium zone. High voltage accidents are not quite so apt to cause death as these tensions are more carefully guarded and have a tendency to throw the victim, etc. The number of cycles in alternating current is important, 39 to 150 cycles being the most dangerous. The cardiac muscle is more tolerant to high cycles. Grounding is also more common than bipolar contact in high tension accidents. The current flow or amperage in a given conductor as you all know is its tension divided by the resistance. The amperage, therefore, gives a more accurate account of the action of a current in the body than its tension (voltage). Chapius states that for normal humans direct circuits of from 200 to 250 Ma. and alternating currents from 70 to 80 Ma. are dangerous. Therefore, if the resistance of the skin is less than 1,200 ohms an alternating current of 110 volts can be fatal, since the intensity would then be 90 Ma.

The high natural resistance of the body is our protective measure to the passage of an electrical current. Resistance is made up of the resistance of the skin at the point of entry and exit plus the resistance of the intervening tissue. Skin is surpassed in resistance only by that of bone. In order we can place the various resistances as bone, skin, cartilage, tendon, the various organs and finally the body fluids. Blood vessels are very good conductors. Many other factors enter to raise or lower skin resistance. Thick, dry skin covered by hair has a relatively high resistance. Moisture such as perspiration and wet clothing lower the skin resistance.

The duration of contact is apparently of great importance. Ventricular fibrillation can be set up in a dog in one-tenth to one-third of a second. Respiration can be stopped almost immediately. In considering the relation of current density to duration of contact, it should be kept in mind that the effects on the heart and nervous system seem to be opposite. Currents of low density seem to have a profound effect on the heart if it is in the current path and little effect on the nervous system. The reverse is true of high density currents. Bipolar contacts are usually more dangerous than unipolar contacts. The current spreads radially from the point of entrance to be collected again at the point of exit from the body. The greatest density is, therefore, at these two points. In unipolar contacts some other part of the body must be suitably grounded for current flow to take place. In bipolar contacts the violent muscular contractions may increase the pressure and duration of contact.

The path of a current through the body is determined by the portions of the body making contact and the resistance of the intervening tissue. Body fluid resistance is low and negligible, as is also that of the blood vessels, and these facts oftentimes determine the course of the current. The current is more apt to go lengthwise through the muscles because of the resistance of the intermuscular fascia to transverse travel. Thus, whether the heart is in the current pathway is of extreme importance. Houston found that 6 amperes of direct current at 115 volts could be applied to a dog's brain without producing death when the path was through the head only, but that only a few tenths of an ampere at this voltage is fatal if the heart is in the pathway. The existence of an idiosyncrasy to electric currents in humans is doubtful. Ventricular fibrillation can be induced easier in depressed and sickly dogs than in vigorous ones. Status lymphaticus, hyperthyroidism, general debility and depressed physical states increase the susceptibility. Surprise and unpreparedness increase the possibility of fatal outcome. These brief facts help us to understand why some men die following low voltage contacts and others are able to resume work immediately after encountering high voltages.

Jaeger states that electric shock is similar to concussion of the brain. Its severity and duration vary within wide limits. Some retain consciousness while others immediately are rendered unconscious. It is said that unconsciousness is immediate in legal electrocution. In industrial accidents it may be of short duration, last for hours or even days and the individual pass finally into a comatose condition, ending in convulsions and death. Others regain consciousness and are able to immediately resume work if no severe injuries have been inflicted. Unconsciousness is more common in accidents due to currents of high tension than in those due to low voltage. Restlessness is common following electrical accidents. It is in these cases of restlessness, coma, etc., where there is a cerebral edema and an increased intracranial pressure that Jellinek advocates spinal puncture and reports many cases with recovery in what seemed to be otherwise fatal accidents.

The pathological picture is not definitely known. In an autopsy performed following a legal electrocution, Langworthy in Baltimore describes alterations of the Nissl substance in the cytoplasm of the nerve cells and a definite shrinkage of the nuclei. This nerve cell injury was diffuse and occurred particularly in the region of the medulla. Others report chromatolysis of the ganglion cells, rupture of and occasionally shrinkage of the cells. Spitzka and Radasch sectioned brains of five legally electrocuted criminals and reported peculiar areas in the region of the small blood vessels in the brain, having a rarefied zone and a peripheral condensed one. They explained these areas on the basis of a sudden liberation of gas bubbles either by electrolytic action or from excessive temperature. Peripheral nerve changes consist apparently of an irritability and lost conductivity. In severe cases the nerves became friable and yellowish gray or are carbonized. The so-called electric cataract and optic atrophy are really a complication or sequelæ of electrical accidents. These are noted especially when the current has passed through the vicinity of the eyes. Changes in the heart are apparently functional alterations which explains the mechanism of death in electrical shock. Most of the observations are based on animal experiments. In cats and dogs an inhibition takes place immediately with low tension currents followed by a fibrillation when the current is broken. The blood pressure rises slightly and then drops and continues to do so after the current is broken. The fibrillating dog's heart does not recover and hence death is immediate. Severing the vagi does not influence its occurrence and hence it apparently results from a direct action on the muscle fibers or ganglion cells in the heart. Ventricular fibrillation has never been demonstrated in humans but is thought to occur. High tension currents on the other hand do not cause fibrillation. When such a current is closed the heart action stops immediately only to be resumed when the circuit is opened, if the current is not applied too long. Arterial pressure then rises again and contractions continue. These contractions continue until paralysis of respiration leads to a gradual decline in blood pressure. This respiratory paralysis which is central in origin is one of the common causes of death in electrical shock of high voltage. Spilsbury compares this respiratory paralysis with that following a blow on the upper abdomen, an irritation of the nasal or pharyngeal mucosa or an unexpected submersion in cold water. He believes a sensory stimulation of the nerves of the skin leads to a reflex paresis of the respiratory center. If the center is not charred or destroyed the chances are very great for recovery, as is demonstrated so clearly both in animals and humans through the prolonged use of artificial respiration.

With the exception of the kidney where an albuminuria and a hemoglobinuria is noticed following an electric shock the changes in other organs are negligible. This albuminuria is thought to be due to toxic products from an abnormal protein cleavage and not due to trauma caused by electricity. It has been noted immediately following legal electrocution. This condition clears up in three days where following industrial accident the victim has lived.

Electricity seems to have some effect upon the coagulability of blood. Alternating current apparently hastens it while direct current delays it. A leukocytosis is common following an electric shock.

From the foregoing statements it readily appears that death from electricity, disregarding the cases in which actual destruction of tissues is so extensive as to be incompatible with life, is due to paralysis of the respiratory center or inhibition of heart action. Urquhart adds to this, death by asphyxiation due to prolonged tetanus, which he observed so commonly in animals.

Concerning the treatment of electric shock the only measure holding any hope is apparently artificial respiration. This should be instituted immediately and kept up until the patient survives or rigor mortis sets in. This makes possible the resuscitation of the paralyzed respiratory center. The passive movements of the chest will also produce slight circulation which together with the ventilating of the blood is often sufficient to revive the vital centers. Power companies at the present time carefully instruct their employes in the proper use of prone pressure resuscitation and physicians called in these emergencies should take advantage of this expert assistance and thereby give the unfortunate victim the greatest possible chance of recovery.

BIBLIOGRAPHY

1. Pack, G. T., and Davis, A. N.: Burns. Lippincott, Philadelphia.
2. Fisher, Hart Ellis: Electrical burns. Ill. Med. Jour., 57:201 (March), 1930.
3. Gaby, R. E.: Electrical burns and electrical shock. Can. Med. Assn. Jour., 17:1343 (November), 1927.
4. Jellinek, Stejan: The curative effect of lumbar puncture in grave electric shock. Wien. klin. Wchnschr., 41:622 (May 3), 1928. Electro-pathological clinic, International Clinics, 1:23 (March), 1929. When is the conservative treatment of electric injuries to be replaced by surgical intervention? Wien. klin. Wchnschr., 41:766 (May 31), 1928.
5. Jaffe, R. H.: Electro-pathology, Arch. Path., 5:837 (May), 1928.
6. Langworthy, O. R.: Nerve cell injury in cases of human electrocution. Jour. Am. Med. Assn., 95: 107 (July 12), 1930.
7. Morgan, J. G.: Case Report. Lancet, 1:756 (April), 1928.
8. Neff, M. L.: Electric shock. California and West. Med., 29:80 (Aug.), 1928.
9. Nelson: Loose Leaf Medicine, 2:662.
10. Thompson, H. G.: Electrical shock, West Virginia Med. Jour., 24:460 (Sept.), 1928.
11. Urquhart, R. W. Ian: Experimental shock. Jour. Indust. Hyg., 9:140 (April), 1927.
12. Wells, Donald B.: The treatment of electric burns by immediate resection and skin graft. Ann. Surg. 90:1069 (Dec.), 1929.

FACTORS OF IMPORTANCE IN THE DIFFERENTIAL DIAGNOSIS OF CHOLECYSTIC DISEASE AND PEPTIC ULCER*

Andrew B. Rivers, M.D.
Division of Medicine, The Mayo Clinic
and
James B. Mason, M.D.
Fellow in Surgery, The Mayo Foundation
Rochester, Minnesota

CHOLECYSTIC disease and peptic ulcer are probably the most common of the organic causes of indigestion. Failure to recognize the complications of such lesions, or the fact that a peptic ulcer and cholecystic disease are associated may result in advising treatment detrimental rather than helpful to the patient. Such treatment may delay rather than hasten return to health, and it may actually jeopardize the chances of eventual recovery.

If peptic ulcer and cholecystic disease are associated, even the most careful observation in hospital may fail to clarify entirely the diagnosis. In a review of a large series of surgically verified cases of associated cholecystic disease and peptic ulcer we[1] found that in 13.6 per cent of cases of duodenal ulcer there was evidence of cholecystic disease (Fig. 1). In cases of gastric ulcer pathologic changes were found in the gallbladder or bile ducts in 7.8 per cent. In a series of 1,026 cases of proved cholecystic disease 7.1 per cent showed evidence of a peptic lesion. The recognition of disease in the gallbladder and peptic ulcer in association is of obvious significance, because non-surgical methods of treatment under such conditions would usually be quite useless.

By collaboration with the roentgenologist valuable assistance in the diagnosis of peptic ulcer and cholecystic disease is usually obtainable. Peptic ulceration may be demonstrated by the fluoroscope and, by perfection of technic and an increased amount of experience, cholecystography has now become a recognized aid in the detection of disturbed cholecystic function or gallstones.

Analysis of gastric and duodenal contents, tests of the stool, and various methods of ascertaining the unimpeded flow of bile from the liver or gallbladder into the intestines are at our disposal and should be utilized to accumulate all possible data for the diagnosis of the unusual case. The modern aids to diagnosis, however, must not supplant the carefully evaluated history if grave errors in diagnosis are to be avoided.

It is important to recognize the syndrome usually brought about by non-complicated peptic or cholecystic lesions, as well as the symptoms which may arise if such lesions are complicated. If an attempt is made to formulate a syndrome invariably characteristic of peptic ulcer or cholecystic disease, regardless of the presence or absence of complication, great difficulty may be experienced in satisfactorily explaining a given syndrome.

Changes in the syndrome of peptic ulcer occur with the development of complications, such as disturbances in mechanics, the natural sequence of pyloric obstruction, or the involvement of adjacent organs through chronic or subacute perforation. With the development of complications of chronic perforation or obstruction the general characteristics of the previously established syndrome usually change. The patient himself is aware that his symptoms are different and thus not infrequently is induced to consult his physician. The clock-like precision of the syndrome disappears. Whereas previously the pain was well localized to a small epigastric area it now has become more diffuse, shifting toward the right upper quadrant, upward into the thorax or through to the back. The pain may be more severe and more persistent. The ingestion of food and alkali, which formerly promptly dissipated the pain, now scarcely affects it at all. The element of periodicity practically disappears, there being trouble every day. There are still periods when the symptoms are somewhat less severe, but the long periods of intermission are no more noticeable. There may be intensification of symptoms after meals or vomiting may be the presenting complaint. Should the patient be examined at such a time there might be but little in the history to suggest ulcer and unless a careful examination is taken an error in diagnosis may result. It is obvious therefore that to make an exact diagnosis it is essential to be able to recognize the symptoms of complicated ulcer.

---

*Abstract of University of Minnesota Extension Lecture given at Hibbing, Minnesota, May 7, 1931.

If a patient is examined during a period when the ulcer is producing slight obstruction, or is in an acute or subacute condition, or if it is penetrating deeply into the wall of the viscus, symptoms may be elicited that may well be mistaken for those caused by cholecystic disease. A carefully taken, complete history, however, will usually disclose that the initial syndrome was different from that presently noted and frequently the period in which such changes occurred can be exactly determined.

The diagnosis of peptic ulcer and cholecystic disease and the differential diagnosis of these two lesions is usually not difficult if carefully controlled laboratory methods are evaluated with judiciously taken anamnesis, and careful chronologic tabulation of the history from the inception of the distress.

Cholecystic disease may manifest its presence in several ways. The symptoms arising from a definitely infected gallbladder or a gallbladder that contains stones may be quite different from those that arise from a mildly diseased organ, giving only reflex symptoms referable to the gastro-intestinal tract. The symptoms of cholecystic disease are more easily evaluated if they are subdivided as follows:

1. Symptoms arising from the inflamed gallbladder itself, which include localized distress, pain, tenderness, and rigidity of the muscles in the upper right quadrant of the abdomen arising from the infected wall of the gallbladder. Involvement of surrounding contiguous organs might intensify or complicate these complaints. An infected gallbladder almost invariably produces symptoms sufficiently definite to permit a diagnosis without difficulty.

2. Symptoms arising from gallstones blocking a bile duct. The migration of a stone into the cystic duct usually produces severe symptoms. Colicky epigastric or right upper abdominal pain is common. Opiates may be necessary to obtain relief. If the stone blocks the cystic duct, chills, fever and jaundice may be added to the symptoms. Coincident with the jaundice, itching may develop, and the coagulation factors of the blood may be disturbed.

3. Symptoms arising as so-called reflex of the gallbladder. These ill-defined symptoms, including upper abdominal flatulence and belching with nausea, particularly after the ingestion of apples, onions, and fried fat food. Vomiting after meals is present. It should be pointed out, however, that such a syndrome is unreliable in indicating the presence of a diseased gallbladder. Nervous indigestion, food allergy, constipation and many other conditions have a similar syndrome.

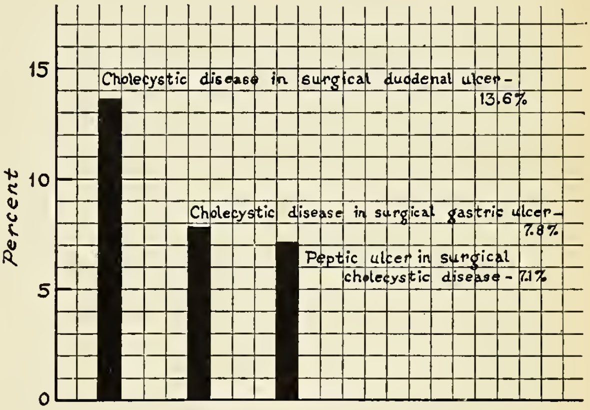


Fig. 1. Incidence of cholecystic disease in surgical gastric and duodenal ulcer, and of peptic ulcer in surgical cholecystic disease.

It is a curious fact that whereas the development of complications may be perplexing in the diagnosis of ulcer, the development of more serious disease in the gallbladder usually facilitates diagnosis. The differential diagnosis of the two conditions could, in many instances, be facilitated if, in a careful search of the patient's history, the present syndrome and the initial syndrome are compared. The development of complications or the period in which such complications arose could thus frequently be ascertained.

ABSTRACTS OF ILLUSTRATIVE CASES

Case 1. Cholecystoduodenal fistula.—A woman, aged sixty-two years, had experienced severe upper abdominal pain and jaundice twenty years previously. There had been no further trouble until fifteen months before admission. At this time she had had very severe pain in the upper right quadrant of the abdomen, which penetrated through to the back and was associated with chills and vomiting. There was no icterus or fever. She remained in bed for three weeks and required several hypodermic injections of morphine. Following this on three occasions she noticed several medium-sized stones in the stool. Further attacks of colic, one six weeks and one three weeks before registration, had occurred. There had also been vomiting, moderate flatulence, and residual soreness in the upper part of the abdomen. A diagnosis was made of chronic cholecystic disease.

General and laboratory data were negative except for a leukocyte count of 15,000. At operation a markedly inflamed gallbladder perforating into the duodenum and associated chronic appendicitis were found. Cholecystectomy and appendectomy were performed and the fistula was repaired.

In this case there was no difficulty in localizing the disease to the gallbladder because the history contained definite evidence incriminating this organ. The pain in the right upper quadrant, referred through to the back associated with chills and vomiting, and requiring hypodermics, furnished evidence of cholecystic disease possibly complicated by cholelithiasis. The discovery of gallstones in the stool in addition to the unusual severity of the pain should have made the clinician suspicious of the presence of a cholecystoduodenal fistula. There was nothing in this history suggesting peptic ulcer. Cholecystoduodenal fistula is the most common of the fistulas arising between the biliary tract and the intestines. It is usually caused by the rupture of a stone from the gallbladder into the intestine. This may result after preliminary infection has approximated the walls of the two organs. It is extremely rare for a peptic ulcer to rupture from the duodenum into the gallbladder.

Case 2. Chronic calculous cholecystitis.—A woman, aged fifty years, for five years had had attacks of sharp pain in the right epigastrium, sudden in onset, lasting from half an hour to three hours, and usually relieved by vomiting. The attacks were followed with right infracostal soreness for two or three days. A hypodermic of morphine was necessary on one occasion. These attacks had occurred at intervals varying from one day to one year; however, there had been almost daily mild epigastric distress for five months prior to registration. There had been occasional distress between meals, relieved by eating, and qualitative food distress with much gas and flatulence. There was no history of jaundice or chills and fever.

A Graham-Cole test showed a poorly functioning gallbladder. Gastric acidity was 36 total, and 12 free. The leukocytes numbered 6,200. Fluoroscopic examination of the stomach was negative. At operation the thick-walled gallbladder was found to be buried in a mass of adhesions. Cholecystectomy and appendectomy were performed. When the gallbladder was incised it discharged thick fluid that contained stones and pus. The common bile duct was moderately enlarged and glands along the duct were markedly enlarged. Hepatitis and pancreatitis graded 2 and chronic appendicitis graded 3 were present. The stomach and duodenum were normal.

The history of this case did not include anything which would suggest peptic ulcer; in practically all details it was characteristic of calculous cholecystic disease. The pain of gallstone colic is not as a rule overlooked by the patient in outlining his symptoms. It is usually very severe, and often comes on without warning and frequently stops just as quickly as it began. There is, as a rule, residual soreness in the right upper quadrant of the abdomen. The pain frequently originates in the upper right quadrant and often radiates through to the right scapular area and at times into the neck. It is lancinating and often requires hypodermics for relief. An attack may stop following vomiting. There is often upper abdominal flatulence. Patients observe that their breath seems to be cut off because of intense pain on deep inspiration. In some cases there are only transitory twinges of upper right abdominal pain which, although perhaps severe, are of momentary duration. If the gallstone becomes impacted in the common bile duct, fever, chills, and jaundice are often added to the symptoms of pain. It must be remembered that occasionally a gallbladder packed full of stones does not cause acute pain because the gallstones are so firmly packed that they cannot migrate into the ducts.

Case 3. Acute purulent cholecystitis.—A woman, aged forty-seven years, came to the clinic stating that for six months she had suffered from frequent attacks of dull pain in the epigastrium, which radiated to the back and the right shoulder. The pains had been fairly severe on one occasion, and had required a hypodermic of morphine for relief. There had been soreness and tenderness constantly in the region of the gallbladder. There had been no qualitative food distress, bloating, belching, jaundice or chills. The patient was moderately obese.

General examination revealed some tenderness over the area of the gallbladder, and the edge of the liver was palpable. The Graham-Cole test revealed a poorly functioning gallbladder. The leukocytes numbered 9,900. Cholecystectomy was performed. Acute cholecystitis and one stone blocking the cystic duct were found. The gallbladder was about 5 by 7 cm. in diameter and was full of pus.

In this case the history was again rather clear-cut and the syndrome fairly definitely involved the upper right quadrant. There was constant soreness and tenderness in the area of the gallbladder. There was nothing suggestive of peptic ulcer, and there was no difficulty in making a diagnosis of cholecystic disease.

Case 4. Subacute cholecystitis.—A man, aged forty-nine years, came to the clinic complaining of seven or eight severe attacks of pain in the right upper quadrant for a period of more than two years. The attacks lasted from four to ten hours, and frequently required hypodermics of morphine for relief. There had been residual tenderness of the right costal margin for one or two days previous to admission. There had been no indigestion in the interval, and no jaundice.

A cholecystogram revealed a poorly functioning organ with multiple stones. General examination disclosed rigidity and tenderness in the upper right quadrant. The leukocytes numbered 6,300. At operation the gallbladder was found to be definitely inflamed with marked edema of its walls and contained multiple stones. There was hepatitis graded 2.

It was not difficult to make a diagnosis in this case. Acute or subacute cholecystitis usually causes complaints which are fairly well referred to the right abdominal quadrant. Tenderness and rigidity may be present in the right infracostal area. The gallbladder may be palpable, and tenderness increases as the palpating hand approaches the region in which the gallbladder is usually found. Although the distress may come on periodically it is not unusual to have the complaint of constant distress in the upper right quadrant which is intensified by the ingestion of food, by walking, or by riding in a car. Flatulence and qualitative food relationship are usually noted. The syndrome lacks the precise regularity of that usually seen with uncomplicated ulcer, although at times the distress is intensified several hours after the meal and in this it may have some similarity to ulcer. An icteric tint to the skin is frequently noted in acute or subacute conditions of the gallbladder, and the icterus index or serum bilirubin may be elevated. The urine may be deeply colored, or stools may be light colored. In such cases a study of duodenal content may be of some aid in diagnosis.

Case 5. Chronic duodenal ulcer.—A man, aged fifty-six years, gave a history of stomach trouble of from five to seven years, consisting of spells of distress lasting from two to five years. Between the attacks there were intervals of freedom from symptoms ranging from five months to three years. The pain usually appeared two or three hours after meals, and reached maximal intensity between the noon and evening meals. Relief had been obtained by the ingestion of food, milk or alkalies, but during the last attack the patient vomited three times before relief was obtained. The pain had been gnawing, and was well localized to a small area in the midepigastrium, without radiation until the last attack, at which time severe pain was referred through to the back.

Estimation of gastric content showed slightly elevated acidity but no evidence of retention. Roentgenograms revealed duodenal deformity. A diagnosis was made of duodenal ulcer. At operation a large perforating type of ulcer was found on the anterior wall of the duodenum 5 cm. below the pylorus. The ulcer was about 2 cm. in diameter. Posterior gastro-enterostomy was made. The gallbladder was normal.

This case illustrates the type of syndrome usually found with peptic ulcer. The history of periodicity, and pain coming late after meals, relieved by food and soda, combined to suggest the presence of a peptic lesion, and the recent increase in the severity of the pain, referred into the back, suggested the perforating character of the lesion.

Case 6. Complicated duodenal ulcer.—A man, aged thirty-one years, had been troubled for four years with severe abdominal cramps which awakened him at night. The cramps persisted for a few hours, and left residual epigastric soreness for one week. There was no nausea or vomiting, and roentgen-ray examination at that time was negative. Following the attack he was well for several months. In the autumn of the same year he had attacks of gaseous indigestion that usually lasted for several hours. This distress was relieved by the ingestion of food and soda. There was no epigastric pain. These attacks came on periodically until the following spring, when definite burning pain appeared three or four hours after the ingestion of food. This was relieved by taking soda. Roentgenograms then revealed duodenal ulcer. For three weeks he was in a hospital on a non-surgical ulcer regimen. He did well on ambulatory treatment that consisted of diet and alkalies for about twenty months, when the trouble recurred. The symptoms were again relieved by non-surgical treatment. After further recurrence of the trouble the patient came to the clinic. At that time the symptoms were more severe, the pain which previously had been well localized to a small area in the epigastrium now involved a large area and during the more severe exacerbations radiated through to the back; control by medical treatment was poor, and although there was no frank hemorrhage the material expressed from the stomach during lavage was blood-streaked.

General examination disclosed some epigastric tenderness. A diagnosis of subacute perforating duodenal ulcer was made. This was verified at operation. The ulcer had perforated through the lower border of the duodenum onto the pancreas.

It should be pointed out that subacute types of duodenal ulcer give rise to a syndrome which may simulate that produced by cholecystic disease. In 37 per cent of the cases with surgically verified subacute duodenal ulcer recently reviewed in the clinic, a preoperative diagnosis of associated cholecystic disease was made. The qualitative food relationship of symptoms, the gaseous indigestion, and the localization of pain to the upper right quadrant furnished some suggestions leading to the erroneous impression of disease in the gallbladder, despite the fact that the history included evidence of ulcer, and the roentgenograms gave evidence of a lesion in the duodenum. A carefully taken history with correlation of roentgenologic data, laboratory investigation and gastric analysis usually should furnish sufficient evidence to make the diagnosis of peptic ulcer. If the fact that a subacute or perforating duodenal ulcer may cause an upper right syndrome is borne in mind, an error in diagnosis can often be avoided.

Case 7. Rupture of a gallbladder.—A woman, aged twenty-seven years, had had appendectomy and right salpingo-oöphorectomy twelve years before admission. For several years gas and belching had troubled her shortly after meals. In the last year before admission she had suffered four attacks of severe pain of sudden onset in the right upper quadrant, lasting for about a week. In each instance the pain radiated around the scapula, and was associated with vomiting. Hypodermics of morphine were necessary to relieve the pain. The second attack was mild; the third and fourth attacks were severe. In the last attack jaundice appeared.

Marked abdominal tenderness over the right upper quadrant was noted. Masses could not be palpated. The skin had an icteric tint. The temperature was normal. The urine showed a trace of bile, and a few erythrocytes and pus cells. Leukocytes numbered 5,800. The serum bilirubin was somewhat elevated. The blood coagulation factors were normal. Operation disclosed a ruptured gallbladder, an abscess at the base of the cystic notch with multiple stones, and a stone in the common bile duct. The stomach and duodenum were normal. Cholecystectomy was performed. The pathologists reported subacute cholecystitis with perforation, and multiple stones.

In this case a preliminary history suggestive of disease of the gallbladder was present for at least a year prior to the time when rupture of the gallbladder occurred. There had been several attacks of severe pain in the right upper quadrant radiating through to the scapula. The onset of this pain was sudden and presented the characteristics often seen in cases of gallstones. The last attack had been severe and there was definite localizing evidence of peritoneal irritation in the right upper quadrant. The history of the case definitely incriminated the gallbladder as the cause of the symptoms. A complication of some type should have been suspected.

Case 8. Acute perforation of duodenal ulcer.—A man, aged twenty-six years, had had occasional mild upper abdominal distress for two years, which usually came on two hours after meals; this was relieved by food or soda. Four months before admission he had had a severe attack of epigastric distress lasting a week. Three weeks before admission he had suffered a similar, although less severe, attack. One day while he was leaning over washing windows, he was seized with a sudden acute abdominal pain. He was brought to the clinic and placed in hospital.

The breathing was chiefly costal. The patient's slightest motion seemed to intensify the pain. The respiratory rate was increasing; the pulse rate was normal. There was board-like rigidity of the abdomen and exquisite abdominal tenderness. The point of greatest pain was slightly above the umbilicus. Visible peristalsis was absent. Leukocytes numbered 11,500. A diagnosis of ruptured peptic ulcer was made. Operation, about two hours after the onset of severe pain, disclosed an acutely perforated ulcer on the anterior surface of the duodenum. The perforation was closed.

In this case the symptoms were characteristic of ulcer for several years before rupture took place. Symptoms of disease of the gallbladder rarely simulates symptoms of ruptured ulcer, although occasionally an acutely infected gallbladder will rupture and the resulting peritonitis may cause a mistaken diagnosis. Rupture of the gallbladder, however, except following trauma, is almost invariably a late development in cholecystitis and a carefully taken history should, as it did in this case, present evidence to aid in making the diagnosis. Acute cholecystitis with rupture of the gallbladder is most common in women, and ruptured ulcer almost always occurs in men. We have been told that perforation of ulcer is not infrequently the first sign of such a lesion. It should be pointed out that perforation almost invariably is preceded by a syndrome of indigestion with definite characteristics of ulcer.

Case 9. Chronic calculous cholecystitis.—A woman, aged forty-seven years, had experienced much gas and belching and abdominal distention for fifteen years. The distress usually came on shortly after meals. At times she had noticed slight cramping pains in the epigastrium. These were of short duration, occurring two, three, or four times a week. Often she experienced distressing epigastric fullness at night. There was definite qualitative food distress, fried greasy food causing the most distress. She frequently had vomited.

The Graham-Cole test revealed a poorly functioning gallbladder. The abdomen was tender to the right of the umbilicus and sensitive over the entire right side. At operation chronic cholecystitis with cholelithiasis was found. The stomach, duodenum, pancreas and ducts were normal.

This case illustrates that the diagnosis of chronic cholecystic disease, even though stones are present, may be extremely difficult. If pain is not distinctly referred to the upper right quadrant, if there is no cramping or colicky exacerbation, and only symptoms of qualitative food relationship, burning and vomiting, the diagnosis may be exceedingly perplexing. The cholecystogram has been of unquestionable value in helping to detect cholecystic disease in such cases. In some cases it would be impossible to make a preoperative diagnosis except through cholecystographic investigation. The so-called reflex to the gallbladder as a cause of indigestion is extremely indefinite. Many of these syndromes have been outlined as being diagnostic of disease of the gallbladder. They may include indefinite epigastric discomfort following meals, flatulence, nausea, vomiting, belching, and bloating after certain types of foods such as onions or apples. We have not found such syndromes reliable in indicating cholecystic disease. Functional disturbances of the upper part of the digestive tract, constipation, and food allergies are likely to give similar syndomes. There should be some hesitancy in assuming that the gallbladder is the cause of such syndromes unless the previous history includes some localized evidence of more severe or more definite disease in the upper right quadrant.

Case 10. Perforating duodenal ulcer with right upper quadrant pain.—A man, aged thirty-five years, stated that for seven years he had had attacks of pain in the right upper quadrant of the abdomen coming in "spells" lasting several days, at the onset occurring three times a year with free intervals, but just prior to admission, twice monthly. The pain was severe, beginning under the right costal margin and radiating along the right costal margin to the back. One year after the onset the appendix was removed and the gallbladder drained without relief. Finally, six months prior to examination at the clinic a diagnosis of gastric ulcer had been made. A diet and alkali powders relieved the pain until two weeks before admission, when the patient noticed that these measures were inadequate. The pain was quite severe and now began to radiate through to the back. Hypodermics of morphine were given. On one occasion blood had been vomited.

There was slight tenderness under the right costal margin and over the right lower quadrant. Masses were not palpable and there was no rigidity. The urine was normal, the leukocytes numbered 9,500, the Wassermann reaction of the blood was negative, and the gastric acids were 90 for total and 70 for free hydrochloric acid. Roentgen-ray examination of the gallbladder according to the Graham-Cole method showed a normally functioning organ. The fluoroscope revealed duodenal deformity. At operation an ulcer of the subacute perforating type was found on the anterior surface of the duodenum below the pylorus. There were no stones in the gallbladder. Posterior gastro-enterostomy was performed.

This case illustrates the fact that subacute perforating duodenal ulcer may produce a syndrome closely simulating that caused by cholecystic disease. The pain and distress may be entirely in the upper right quadrant. There is, however, usually something included in the history, such as food ease, soda ease, or distress, reaching maximal intensity several hours after the meal, which suggests a peptic lesion. If the history includes hemorrhage, such as was noted in this case, the diagnosis is made more easily; otherwise roentgen-ray data may be the determining factor.

Case 11. Duodenitis and a history suggesting a lesion of the gallbladder.—A woman, aged forty-five years, complained of having had stomach trouble for ten years. Attacks lasted two or three weeks and occurred two or three times a year. The distress ranged from mild to definite pain in the midepigastrium and occasionally this was referred to the back. The distress came on from half to one or two hours after meals, always with much gas. It usually followed the ingestion of fried greasy food. There had been no jaundice, no colic, and no vomiting. Soda and food occasionally relieved the distress.

The systolic blood pressure was 120 and the diastolic 70 in millimeters of mercury. There was slight tenderness in the right upper quadrant. The urine was normal, leukocytes numbered 7,700, and the gastric analysis gave total acidity 48 and free hydrochloric acid 34; the total quantity aspirated was 120 c.c. Roentgenograms of the stomach were negative. A diagnosis of chronic cholecystitis was made. At operation a normal gallbladder and a normal-appearing liver were found. The stomach was somewhat thickened and dilated. Diffuse duodenitis was noted, and the pylorus was found to be hard, firm and sclerosed. Pyloroplasty and appendectomy were performed. The pathologists reported duodenitis and chronic catarrhal appendicitis. Convalescence was without incidence and thus far the patient has remained well.

This case demonstrated that duodenitis may closely simulate a syndrome caused by cholecystic disease. Usually, however, there are certain characteristics, such as food ease, soda ease, periodicity or distress coming late after meals, which offers some assistance in diagnosis. A recent review in the clinic of a large series of surgically verified cases of duodenitis suggests that duodenitis, even if unassociated with ulcer, can be a formidable lesion of definite clinical significance.

SUMMARY

Complicated cholecystic disease usually is productive of a syndrome which so definitely focuses attention to the region of the gallbladder that diagnosis is made without difficulty.

Subacute duodenal ulcer, duodenitis, or subacute perforating duodenal ulcer frequently produces a syndrome which may simulate that caused by disease of the gallbladder. The pain may be in the right upper quadrant, referred upward over the region of the liver, and there may be associated flatulence and qualitative food distress. The history, however, usually includes sufficient characteristics of ulcer, such as distress late after meals, food ease, soda ease, and periodicity, to make diagnosis possible.

In a review of a history it is important to obtain information regarding the present attacks of dyspepsia and to compare these with previous gastro-intestinal exacerbations.

By the judicious evaluation of data obtainable throughout the history of the case, roentgenologic investigations, and the laboratory aids such as icterus index, serum bilirubin, and occasionally studies of duodenal contents, the differential diagnosis of cholecystic disease and duodenal ulcer usually is possible.

BIBLIOGRAPHY

1. Rivers, A. B., and Mason, J. B.: The association of peptic ulcer and cholecystic disease. Minnesota Med., 14:330-335 (April), 1931.

CONCERNING LIMITATIONS OF THE CLINICAL SIGNIFICANCE OF LOW BASAL METABOLIC RATES*

C. A. McKinlay, M.D.
Minneapolis

ALTHOUGH, with the advent of simplified methods, clinical calorimetry has become a common procedure, its value in diagnosis and as an indication for therapy is proportional to an appreciation of all the factors that influence the energy exchange of the body. Recent reports by Thurmon and Thompson,[5] and Remington and Culp,[4] tend to show low basal metabolic rates are not uncommon in individuals who are apparently normal or who have only minimal functional disturbances without myxedema. A preliminary report of a study of a group of young adults which shows similar results is included in this paper.

On the other hand the clinical significance of increased heat production is usually clear, as the diseases (other than hyperthyroidism) that have increased basal metabolism by their nature are not usually confusing; for instance, leukemia, polycythemia and acromegaly are not common and have, of course, other and better diagnostic criteria. In addition, pyrexia should be kept in mind for, in almost all infections, increases of basal metabolism of approximately 7 per cent per degree F. occur.

While the usually accepted range of normal variability is within plus or minus 10 per cent, it should be mentioned that the Aub-DuBois standards in common use are approximately 4 or more too high according to Krogh.[3] Myxedema, with rates from minus 25 to minus 40, is usually outspoken in its manifestations and need not be considered here. The glandular dyscrasias other than myxedema or Fröhlich's syndrome and other hypopituitary states and Addison's disease are not common, and have outstanding physical characteristics; all may have a reduced metabolism. However, the establishment of a diagnosis of hypothyroidism without myxedema requires careful study of each individual case beyond obtaining a laboratory report of a basal metabolism of from minus 15 to minus 25 per cent. The interpretation must include consideration of other conditions, aside from diminished thyroid function, that are associated with lower metabolism. Benedict[4] showed that the basal metabolism in a starving individual fell 30 per cent, and that[2] in a group of young men on a low caloric diet (approximately 1,400 calories for three weeks) the basal metabolism fell 18 per cent. This reduction is probably due to a protective mechanism on the part of the body, not, however, a primary thyroid influence. While starvation is rare, the physician frequently sees under-nourished individuals who, for various causes, at times imaginary, have restricted their diet to a point of caloric deficiency. Although in under-nutrition thyroid deficiency is not primarily present, if the condition is of such long standing that there may be secondary alteration of thyroid function, the use of thyroid extract has been suggested in treatment in combination with increased food intake.

Since muscular inactivity tends to depress the basal metabolism it should be remembered that in invalidism, as in certain anemias and arthritic conditions with long periods of inactivity, there may exist secondary lowering of basal metabolism.

Keeping in mind, then, that physiologic and pathologic states, other than a primary change of thyroid function, tend to depress the basal metabolism of the body, the physician will be in a position to evaluate a reduced basal metabolism in individuals without myxedema. It presupposes that a complete study of the case has been made, that chronic infection, including tuberculosis, and anemias or other chronic states with invalidism have been excluded or evaluated and that there is no demonstrable cause of symptoms.[6] After exercising such caution, there remains a group of cases with fatigue, exhaustion, low energy level, anemia, unexplained dizziness, sensitivity to cold, drowsiness, obesity without overeating, sterility and menstrual disorders, in which the therapeutic trial of thyroid extract is justified even though physical signs in the form of skin and hair changes are minimal or not demonstrable. While a number of these individuals may respond well to treatment, there will be differentiated by this therapeutic test the group without improvement and presumably without any thyroid deficiency. This group is worthy of further study. Undoubtedly some of them have a nutritional deficit sometimes on an infectious basis which has not been evaluated. Although under-nutrition itself tends to depress basal metabolism, it is somewhat paradoxical that under-nutrition may be, and often is, due in some degree to the high rate of energy exchange characteristic of hyperthyroidism. In obesity, normal values usually obtain although there is a tendency for some individual cases to have low basal metabolism.

---

*Presented before the Hennepin County Medical Society, February 18, 1931.

Some of the group with low basal metabolism appear to be entirely normal. Is their low metabolism comparable to the physiologic slow pulse, low temperature and low blood pressure of certain individuals? In such individuals studied after the development of some complaint, the normality of a low basal rate for the individual should be kept in mind. Whether some of this group will later develop hypothyroidism or myxedema is a question. Against this, evidence exists that hyperthyroidism is a precursor of myxedema in a certain percentage of cases where hyperfunction of the gland leads later to retarded or absent activity.

A study is being made of a group of individuals without marked physical defects. Determination of the basal metabolic rate was made often on account of rather minor non-capacitating disturbances of function, as overweight, underweight, menstrual disturbances and fatigue, and also on account of colloid goiter. None had myxedema. Multiple determinations made on a group of 155 students, aged 17 to 35, at the University of Minnesota, are referred to. The Roth-Benedict apparatus was used in 134; the McKesson in 20; usual standard basal conditions were obtained and Aud-DuBois standards were used.

It is seen that over one-fourth of this group had low basal metabolic rates. While in some of these under-function of the thyroid may be present as indicated by response to substitution therapy, in many others no such under-function was established. A study is being made of this group, in order that the proportion of normal individuals may be established from the results of complete routine examination.

In conclusion, the increased clinical use of the determination of basal metabolism makes imperative a critical attitude in its interpretation as a diagnostic aid. It must be kept in mind that under-nutrition and inactivity tend to depress the basal metabolism and that certain apparently normal individuals have the basal metabolism below normal limits according to standards and procedure in common clinical use. The findings in a group of 155 young adults with good working capacitty show that in 27.9 per cent the basal metabolic rates were below normal.

TABLE I

Total No. of cases	M.	F.	B.M.R. below — 10 per cent M.	B.M.R. below — 10 per cent F.	B.M.R. above + 10 per cent	Total per cent with B.M.R. below — 10 per cent
154	41	113	12	31	4	27.9

REFERENCES

1. Benedict, F. G.: Carnegie Institution of Washington Publication, No. 203, 1915.
2. Benedict, Miles, Roth and Smith: Carnegie Institution of Washington Publication, No. 280, 1919.
3. Krogh, August: Quoted by DuBois, E. F.: Basal Metabolism in Health and Disease. P. 151. Lea & Febiger, 1927.
4. Remington, R. E., and Culp, F. B.: Basal Metabolic Rates of Medical Students and Nurses in Training at Charleston, S. C. Arch. Int. Med., 97:366, March, 1931.
5. Thurmon, F. M., and Thompson, W. O.: Low Basal Metabolism without Myxedema. Arch. Int. Med., 46:879-897, November, 1930.

THE ADHESIVE BANDAGE IN TREATMENT OF VARICOSE ULCER*

CLAUDE F. DIXON, M.D., and FREDERICK L. SMITH, M.D.
Rochester, Minnesota

THE injection treatment of varicose veins has become established. Application of an adesive bandage, combined with injection, or aplication of an adhesive bandage only, is proving fficacious in the treatment of varicose ulcers, hich are the most common ulcers of the lower xtremity. By directing attention to those ulcers f the lower extremity which are associated with rteriovenous fistula, it may be seen why the use f an adhesive bandage would be of value in the eatment of varicose ulcers. In order that oxyn may be properly distributed to the extrem, the blood must pass through the capillaries fore reaching the venous system. In the arriovenous fistula the blood does not pass rough the capillaries but is emptied directly om the artery into the vein. Consequently, and gically, ulcers which develop in connection with arteriovenous fistulas of the lower extremity occur below the arteriovenous opening. If a tight bandage is applied in such a case so that the vein at the point of the fistula is compressed and blood is forced to pass through the capillaries, healing rapidly follows. Recurrence eventuates if the bandage is discarded for any length of time.

In varicose ulcers of the lower extremities conditions as follows are often present:

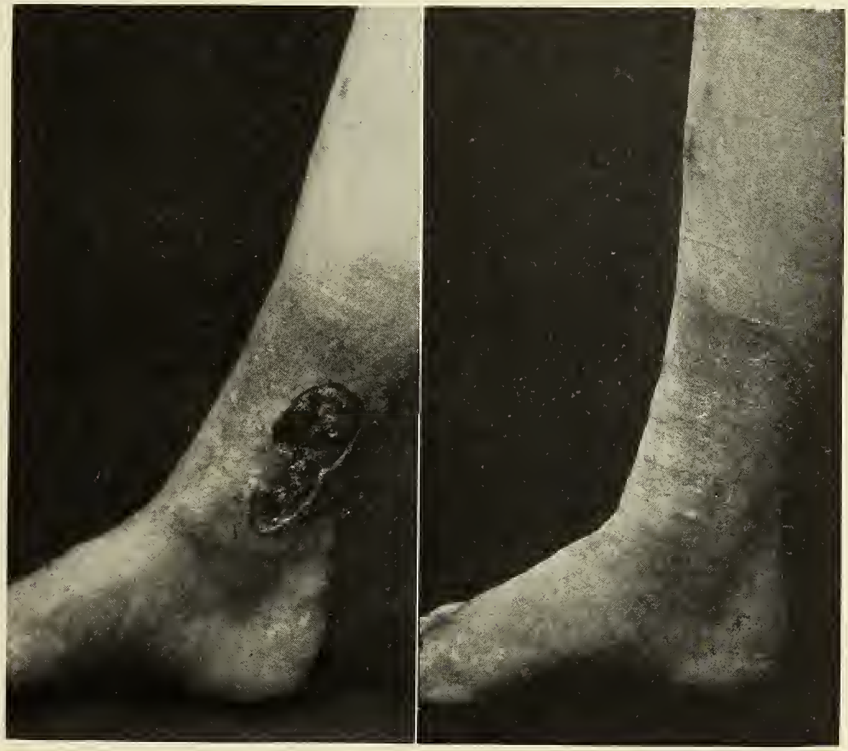


Fig. 1. Before treatment.

Fig. 2. After treatment.

Group 1.—Huge, tortuous veins which have permitted slowing, complete stoppage, or even reverse flow of blood, cause improper oxygenation, as in the arteriovenous fistula, and ulcer results in many instances. If a tight bandage is applied or the veins are injected in this type of case, healing results because the stagnant pool of poorly aerated blood has been eliminated and circulation has been formed through the capillaries. In this particular group if the ulcers are large and markedly infected, we suggest bandaging for two or three weeks, after which partial or complete healing will have taken place and the infection and edema will have definitely decreased. Injection of the veins may then be carried out with complete and permanent healing of the ulcer.

---

*Submitted for publication May 5, 1931.

Group 2.—Much the same condition exists in these cases as in those of Group 1 except that the tortuous or obstructed veins are in the muscles and therefore are not visible and, in many instances, not palpable. In this type of case, obviously, treatment of the ulcer may be carried out by means of bandaging alone. Occasionally, after the ulcer has healed and the bandage is discarded, premonitory symptoms of recurrence appear, such as eczema, cyanosis, and edema. Bandaging again should be resorted to, and at irregular intervals, as indicated.

The use of Unna's paste casts have been of much value in the treatment of varicose ulcers. Any compression bandage is of benefit in the treatment of this condition. The difficulty with the bandages used heretofore has been that they did not remain snug; thus recurrence of the engorgement of the tortuous veins was permitted and the purpose of the bandage more or less defeated.

The two cases presented at the end of this paper illustrate each of the two groups of varicose ulcers and the results obtained following the use of an elastic, adhesive bandage. In case 1 the bandage was supplemented by injection. In case 2 the bandage only was employed.

The elastic, adhesive bandage may be applied directly over the ulcer or a piece of plain gauze may be placed over the ulcer before the bandage is applied. It is well not to change the bandage for several weeks, particularly if the ulcers are large, unless the patient experiences discomfort, which is rare. However, a new bandage may be applied every week or two without hindrance to healing. If the limb is markedly swollen, the first bandage should be applied when the swelling is at a minimum; for example, in the morning. Discomfort may be experienced for an hour or two, after which comfort and freedom from symptoms are the rule. In huge ulcers it is obvious that several weeks may be required for complete healing.

A skin graft, followed by the immediate application of a bandage on an ambulatory patient, has been of considerable value. The graft is applied as follows: Five or six small strips of skin, 1 to 2 mm. wide and 10 or 12 cm. long, are taken from the thigh. By the aid of a fascia needle these threads of skin are sewed into the ulcer in lattice fashion, without care or caution as to the position of the epithelial surface. This method can readily be carried out in an office under local anesthesia. In order to obtain a good result the graft must be used on a granulating surface.

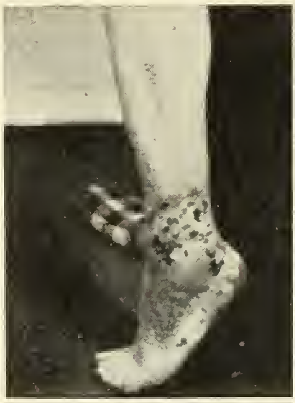


Fig. 3. Before treatment.

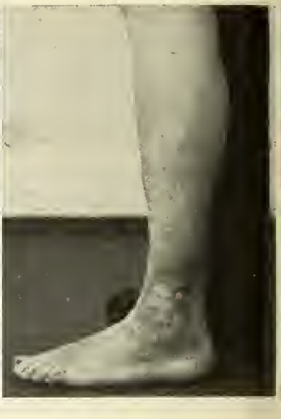


Fig. 4. After wearing bandage nine days.

REPORT OF CASES

Case 1.—A woman, aged fifty-four years, had a large varicose ulcer on the inner aspect of the right leg. There were several medium-sized, tortuous veins over the posterior aspect of the leg. An elastic, adhesive bandage was applied over the entire extremity. The bandage was replaced three times during a period of eight weeks, at the end of which time the ulcer had healed completely. Four injections of quinine dihydrochloride and urethane (dose 2 c.c.) were given after completion of the bandaging treatment (Figs. 1 and 2).

Case 2.—A man, aged forty-four years, had had multiple ulcers over the outer aspect of the lower part of the left leg and ankle for six months. During the last three weeks retraction of the heel and pain had made it necessary for him to resort to crutches. An elastic, adhesive bandage was applied over the foot and lower part of the leg. Relief of pain was experienced in a few hours and he could walk comfortably without the use of crutches in five days. The bandage was removed in nine days, at which time the ulcers were completely healed (Figs. 3 and 4).

RETROCECAL APPENDICITIS*

Herbert Busher, M.D.
St. Paul

IF the appendix lies behind the cecum, and is consequently hidden from view upon opening the abdomen, it is called a retrocecal appendix. Such an appendix was found in 17 per cent of all appendectomies at the Boston City Hospital, and in 25 per cent at the Johns Hopkins Hospital, according to their recent reports. It occurred twice as often among men as among women. It was adherent and kinked twice as frequently as the normally situated appendix. The mesoappendix was usually shorter than normal, and sometimes entirely lacking. In the latter case, the appendix lay beneath the peritoneum of the cecum, commonly between the cecum or ascendng colon and the psoas muscle which forms the posterior abdominal wall at this point. An appendix so located is retroperitoneal as well as retrocecal, and occurred thus in 2 per cent of all cases reported in these statistics. Most of the appendices "not found" are of this sort. Frequently an originally free retrocecal appendix may be so concealed by an adherent cecum that t will be erroneously considered to be retroperioneal. A retrocecal appendix may be straight, kinked, or curled up. It may point directly upward, or to one or the other side.

The reason for the frequent occurrence of a retrocecal location of the appendix lies in the atter's embryological history. In a very early mbryo the primitive gut is a straight little tube of even caliber. It soon outgrows the capacity of he abdominal cavity and forms a loop which extends part way into the umbilical cord, suspended by a long mesentery. When, in the third etal month, the gut returns into the abdomen, t can crowd in only by forming numerous maller loops. The lower portion, destined to beome the colon, now forms a semilunar loop, omewhat larger than the many smaller loops of he upper portion representing the small intestine. This colonic loop then rotates around the small ntestine in a counter-clockwise manner, carryng with it its mesentery like an opened fan. In he fourth month the primitive cecum lies in the upper right abdomen under the liver. From then on until birth there occurs a gradual descent of the cecum into the iliac fossa. During this time the lower end of the cecum lags in growth and becomes the appendix. Also during this period of descent, the mesentery of the cecum and colon becomes adherent and fuses with the parietal peritoneum of the abdominal wall behind it. Thus it happens that the posterior wall of the cecum descends more slowly than the free and unhampered anterior wall, and a certain amount of curling backward of the cecum is quite the usual thing. It is surprising, therefore, that not every appendix is retrocecal. If, as occasionally happens, the tip of the appendix becomes adherent to the posterior abdominal wall in the region of the right kidney, as the cecum descends, a true extraperitoneal appendix is the result.

Acute inflammation is relatively more common among retrocecal appendices than among those normally situated. Especially true is this where the appendix is actually retroperitoneal. Aschoff states that the retrocecal position makes emptying of the appendix difficult, and at the same time makes obstruction of the blood supply easy, because of the bend that is present, opposite to the general direction of peristalsis and circulation. And for this reason inflammation and gangrene are common. Howard Kelly thinks that in cases of retroperitoneal appendices the friction against the psoas muscle in walking may cause an irritation not experienced by a free appendix. Small found perinephritic and subphrenic abscesses more prevalent in cases of appendicitis of the retrocecal variety. This seems logical when one considers the close proximity of the right kidney and the looseness of the connective tissue behind the peritoneum in that vicinity. On the other hand Quain and Waldschmidt, reporting a thousand cases of appendicitis, found the retrocecal type less dangerous than the average, for the simple reason that the retrocecal appendix lies in an out-of-the-way corner as far as the general peritoneal cavity and its contained viscera are concerned, where it can more quickly and more easily be walled off.

---

*Read before the Ramsey County Medical Society, St. Paul, April 27, 1931.

The clinical picture of retrocecal appendicitis is unusual only in that small percentage of cases where the appendix is not free and pendulous but is either retroperitoneal or enclosed in a pocket behind a posteriorly adherent cecum. However, in these few instances we encounter symptoms out of the ordinary. On the one hand, as Behan has pointed out, the peritoneal irritation of the sympathetic nerves is minimal. Hence, the midabdominal or epigastric ache, accompanied by nausea and vomiting, is not as prominent as it is in an ordinary attack of appendicitis, and may even be absent in a frank retroperitoneal case. On the other hand, the irritation of the sensory nerves of the abdominal wall takes place more promptly. Local pain and tenderness, and muscular rigidity, therefore, become early symptoms; in fact, they frequently are the first to appear. Their location also is different from that in ordinary appendicitis. Due to a higher and more posterior nerve irritation the pain, tenderness on pressure, and muscle rigidity are found more commonly in the flank or lumbar region rather than in the lower right quadrant. And to confuse the picture still more there exists a tendency for the pain to radiate toward the inguinal region, a circumstance which Mackenzie explains upon the basis of the radiation of the nerve fibers which supply the region of the kidney and ureter. Bruno Cohn draws our attention to a symptom quite characteristic of a retrocecal retroperitoneal appendicitis, due to an irritation of the psoas muscle. The patient will lie with the right thigh flexed in order to favor the psoas, and an attempt to extend the thigh causes increased pain. If a case progresses to abscess formation, the dullness and resistance to pressure are located more commonly in the flank between the rib margin and the iliac crest. Farther anteriorly the gas filled cecum and colon will overlie the abscess and tympany on percussion is more often found than dullness.

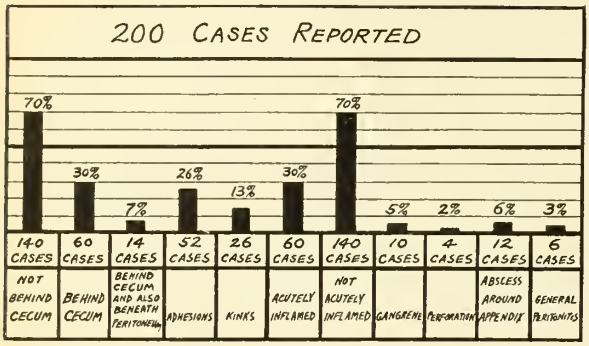


Fig. 1.

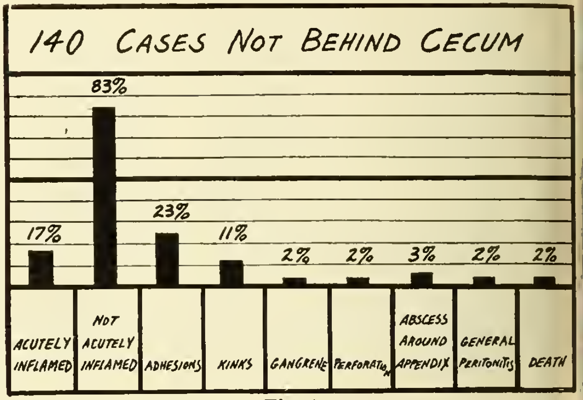


Fig. 2.

From a practical standpoint the most important question about retrocecal appendicitis is that of differential diagnosis. Occasionally the possibility of a gallbladder disease may enter into the picture. Close analysis of the previous history, and the radiation of the pain, together with Graham-Cole cholecystography if time permits, will usually clear up the uncertainty. More frequently we must differentiate retrocecal appendicitis from right urinary disease, particularly from acute pyelitis. Especially now, when our attention is drawn constantly to the numerous unnecessary appendectomy scars in cases of right urinary trouble, we must beware of the rare but real possibility of making the opposite blunder of mistaking a retrocecal appendicitis for a pyelitis. Guy Hunner emphasized this danger when he reported cases in which inflamed appendices lay behind the ascending colon and near the ureter. In these cases he found lumbar pain radiating into the groin and thigh, accompanied by frequent and burning urination, and found blood and pus in the urine. Such symptoms are undoubtedly very misleading. In discussing the diagnosis of these cases, H. W. Carson brings out a few differences which should be kept in mind. Acute pyelitis usually begins with chills followed by high fever, both of which symptoms are very unusual in early appendicitis. Another distinguishing point is the contrast between the subjective pain and the objective tenderness. In pyelitis the patient complains of great pain but is not very tender on pressure, whereas in retrocecal ppendicitis the pain is only moderate while the enderness is great. With this greater tenderness goes a muscular rigidity which is rarely found n pyelitis. Of course, if time permits, pyelography and intestinal radiography may simplify he problem. However, if, after a careful study, here still exists an honest uncertainty, it is wisest o operate, in view of the possible greater danger f an overlooked retrocecal appendicitis.

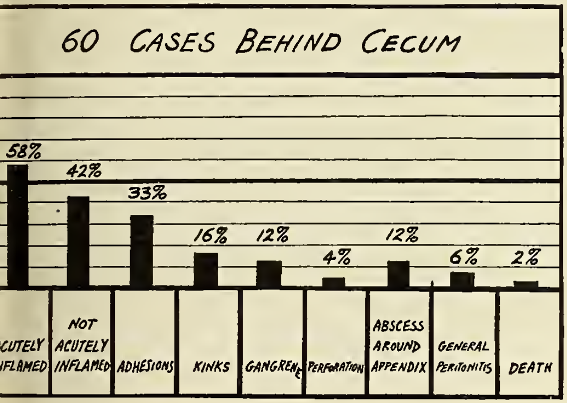


Fig. 3.

I wish to present an analysis of the anatomical nd pathological findings in two hundred consecutive appendectomies. This series includes ses operated upon primarily for disease of the ppendix, and also cases in which the appendix as removed secondarily in the course of operaons for other abdominal conditions. For the ke of brevity and clarity I will present this alysis in the form of graphs, to be thrown n the screen.

SUMMARY

1. In 200 consecutive appendectomies a retrocal position of the appendix was found in 30 r cent of the cases, and a retroperitoneal as ell as retrocecal position was found in 7 per nt of the cases.

2. Acute inflammation of the appendix was und to be three times as frequent among the trocecal group and five times as frequent in the retroperitoneal group as in those normally situated.

3. The retrocecal position of the appendix was found three times as frequent among the cases of acutely inflamed appendix as among the non-acute, and the retroperitoneal position was found seven times as frequent among the acute cases as among the non-acute.

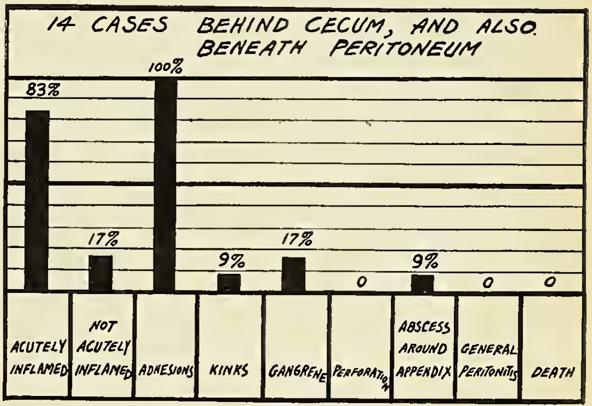


Fig. 4.

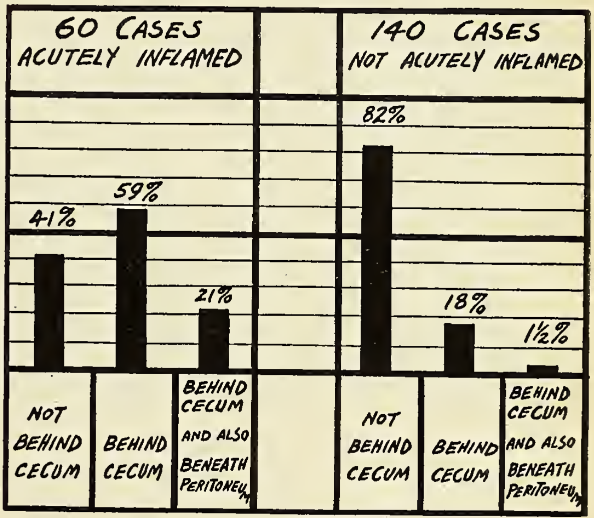


Fig. 5.

Conclusion.—A retrocecal position of the appendix, especially when it is also retroperitoneal, is an important factor causing the appendix to be susceptible to acute inflammation.

COMPRESSION FRACTURES OF THE VERTEBRÆ

M. H. Tibbetts, M.D., F.A.C.S.
Duluth

In order clearly to distinguish between a compression and a comminuted fracture we may define the former as a crushing injury which results in a lessening of the vertical height of the body. Most of this occurs at the anterior portion of the bone and forms a so-called "wedge deformity." As a rule, the posterior area remains intact and offers a point of leverage to be utilized in treatment. This will be alluded to subsequently. This fracture is really a telescoping of a portion of the body as contrasted with dissolution of the vertebra into several fragments, unimpacted, as seen in the comminuted fractures.

The compression fracture is usually brought about by a "jack-knifing" or acute flexing of the spine. The resilient intervertebral discs are unable to absorb all of the force and the trabeculæ of the bone telescope with each other. Falls of varying heights may be the immediately inciting cause. Even being thrust into a sitting position unexpectedly has resulted in a compression. Auto collisions are increasingly responsible for some of these lesions. The mechanism here is again acute flexion—probably with feet braced and body thrown forward by the sudden impact. Some are due to direct crushing blows, as in cave-ins in a mine or a falling roof.

Regarding sex, women are appearing more frequently in the list with the increasing use of the automobile. Before this, males predominated, owing to their more frequent exposure to hazards in line of their occupations. Adults seem to have a corner on the malady, and adults past middle life subjected to the same hazards are much the more susceptible.

There are no pathognomonic symptoms. They are simply those resulting from any acute injury and are pain on attempted motion, tenderness on direct pressure over the lesion, and increasing pain in the sitting or upright position.

The most serious complication is, of course, varying degrees of injury to the spinal cord, from slight edema to complete severance. Regarding the next point, I am not entirely convinced as to whether it should be listed as a complication or a symptom. Indeed, it has appeared so uniformly in my own series of cases that I have almost concluded that it must be a constant factor. I refer to the distressing abdominal distention. It is painful and most resistant to remedial attempts.

Roentgenographs taken in the anteroposterior and lateral views clinch the diagnosis. Unfortunately, they are too frequently omitted and too many of these lesions go unrecognized. Wallace[4] goes so far as to state that 50 per cent are not discovered until secondary symptoms cause increasing disability, and increasing deformity impels the attending physician to seek roentgenologic evidence.

As will be shown later, inasmuch as with early treatment practically normal restoration of the form of the vertebra can be accomplished, a strong plea is here made for more careful search for these lesions. The lateral X-ray view is all-important, and if taken more frequently fewer disabling backs will come up for compensation adjustment.

Tuberculosis of the spine in its typical form simulates the wedge deformity so closely that superficial scrutiny may confuse the two. The tuberculous lesion usually causes destruction of the intervertebral disc not seen in fractures. In general, it causes much more atrophy of the body along with actual destruction and there is usually evidence of abscess formation.

Rickets, giving rise to a rounded adolescent kyphosis, usually results in wedge shaped vertebra, but these are most frequently multiple and show no widening of the body as is frequent in fracture.

The wedging seen in osteoarthritic spines and the collapse of a carcinoma metastasis must be kept in mind. The former offers real difficulty especially if there is a history of injury. Unless seen soon after the accident, when definite evidence of fracture can be seen, differentiation is often impossible.

TREATMENT

We come now to the main point of this presentation—the treatment.

---

*From the Duluth Clinic.

It is only within the last few years that much has been said or written regarding the correcion of these deformed vertebræ. Davis[1] of Erie, Pennsylvania, has furnished an excellent bibliogaphy, citing some seventy-five different articles. He described a method by which these crushed ones could be restored to practically their orignal shape. The basis of his treatment is dependnt upon hyperextension of the spine. The lateral rticular processes, the posterior portion of the ody of the vertebra and the lateral masses, contitute a fulcrum by which the crushed vertebra s pulled apart. The strong anterior ligament of he spine prevents too great an extension and also cts as a limiting membrane, according to Davis, which helps in splinting the crushed fragments nd in holding them in place.

The method used by Davis is to anesthetize the atient, place him prone upon a table, and then with traction on the feet lift the pelvis entirely free from the table. While in this position gentle manipulation is performed at the site of the deformity, pressing downward on the deformed vertebra to bring it back into its proper alignment. After this a long posterior plaster shell is applied, the patient then turned on his back after the plaster has sufficiently hardened, and an anterior shell (holding the spine in hyperextension) applied.

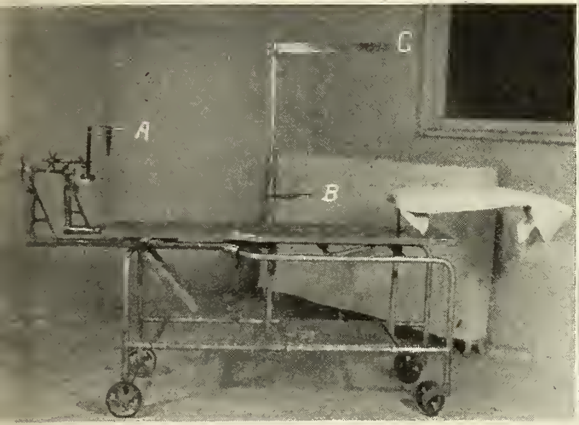


Fig. 1. The Hawley table. (A) Foot attachments for counter-traction; (B) Sacral rest; (C) Overhead bars.

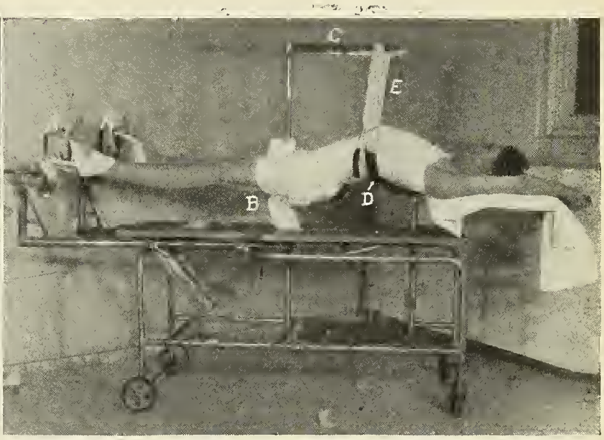


Fig. 2. Patient on Hawley table, showing: (A) Foot attachments; (B) Sacral rest; (C) Overhead bars; (E) Muslin bandage lifting spine into hyperextension; (D) Heavy saddle felt to protect against pressure.

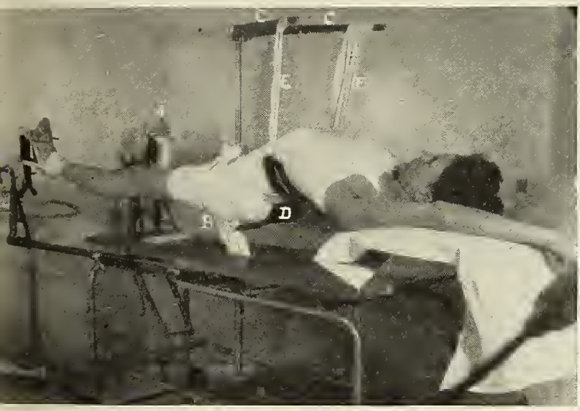


Fig. 3. Same as Figure 2 from a different angle.

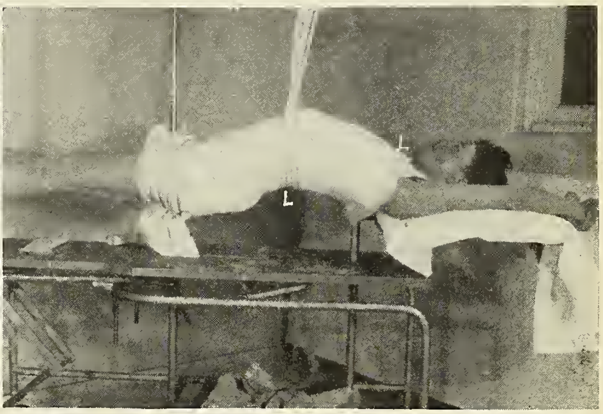


Fig. 4. Showing the points of leverage to maintain hyperextension.

Dunlop and Parker[2] of Pasadena, California, later described a manipulation to accomplish the same thing, which they developed entirely independent of Dr. Davis' method. Their procedure requires five assistants besides the operator: two men hold the feet, two others hold the upper end of the patient by a sheet folded and passed under the chest and arms, while the operator and his assistant hold a folded sheet under the site of the fracture, the patient first being thoroughly anesthetized and laid on his back. Then the four men (two at the head and two at the feet) throw the patient upward, exerting strong traction all of the time, and then allow the body to drop down and be caught by the operator and his assistant, care being taken to keep the spine in the hyperextended position during this maneuver. The jerking thus obtained presumably dislodges the impacted fragments and allows the vertebra to assume its normal position through hyperextension. After this manipulation a plaster cast is applied with the back in the hyperextended position.

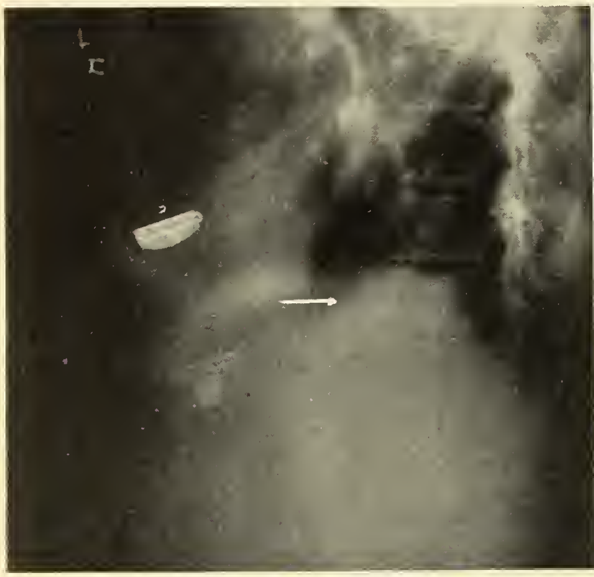


Fig. 5. Case 1. X-ray before reduction, showing compression of eleventh thoracic vertebra.

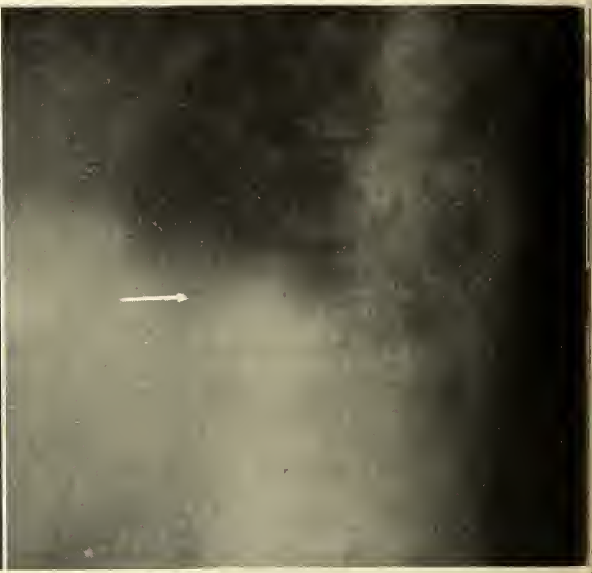


Fig. 6. Case 1. X-ray after reduction. Note restoration of anterior border of eleventh thoracic vertebra.

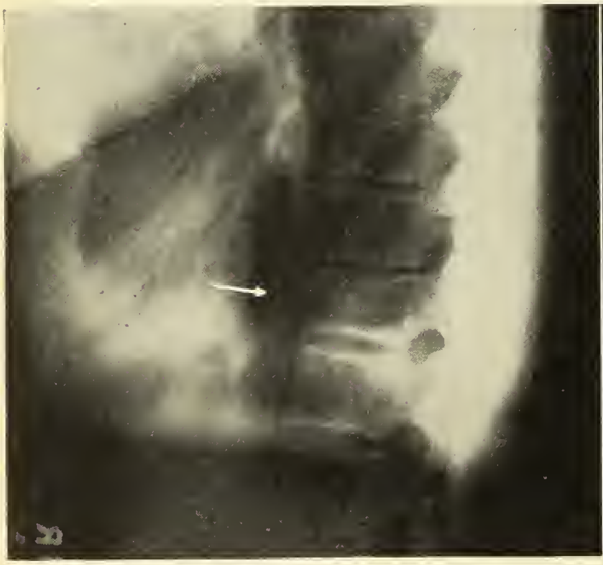


Fig. 7. Case 1. X-ray nine months after Figure 5. Bony restoration of trabeculæ.

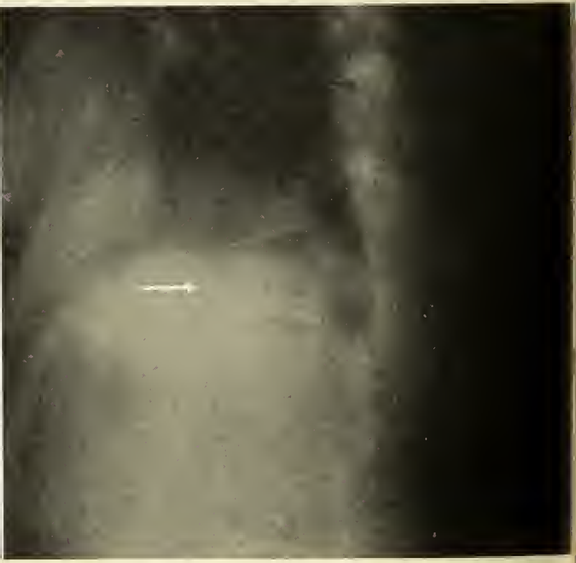


Fig. 8. Case 2. X-ray before reduction. Compression twelfth thoracic vertebra.

Still another procedure has been described by Rogers[3] of Boston, which does not require the patient to be anesthetized, and the manipulatio is carried out over a period of several days, usin a frame similar to a Bradford frame. The difference in this particular frame is that the latera bars are made of flat spring steel rather than round tubes. The lateral bars being made of spring steel will thus bend into a convex or a concave position, but will not bend toward each other. The patient is placed upon the frame and the frame is then made convex gradually over a period of several days until the required amount of hyperextension is obtained. The patient remains on this frame for several weeks. The contribution which I am offering is that manipulation can be carried out under spinal anesthesia and can be done on an ordinary Hawley table with minimal assistance.

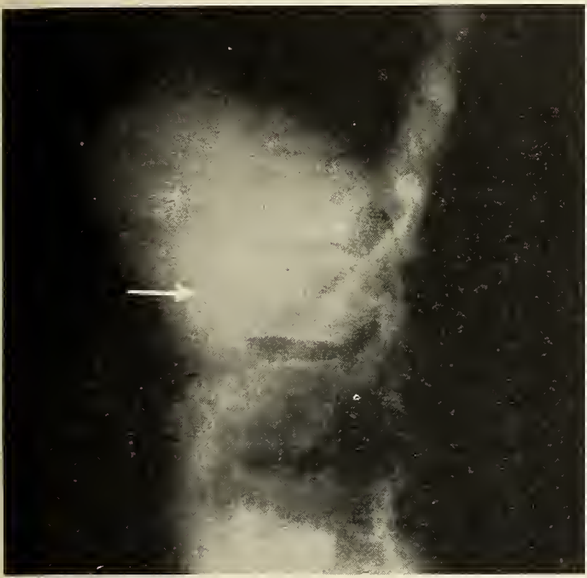


Fig. 9. Case 2 after reduction.

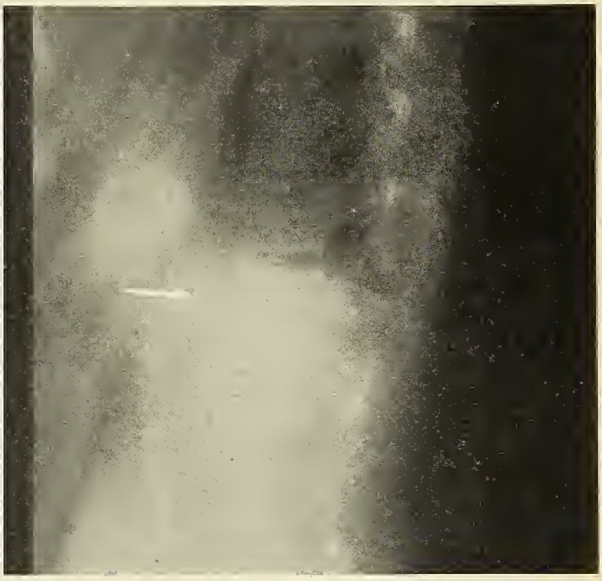


Fig. 10. Case 2. X-ray five months after reduction.

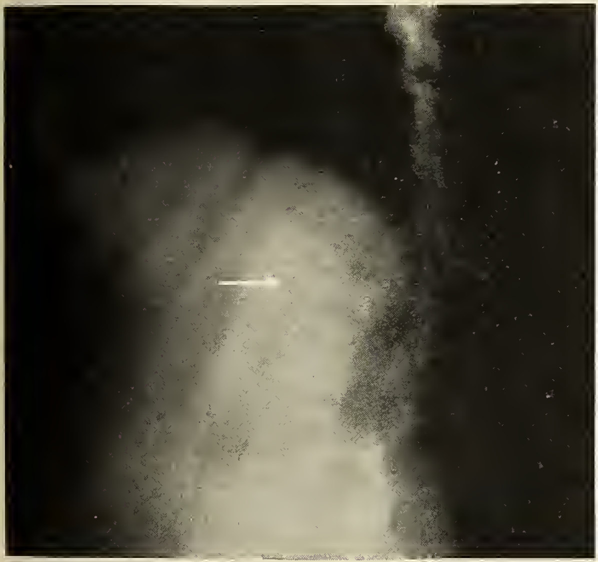


Fig. 11. Case 3. X-ray before reduction showing compression of first lumbar vertebra.

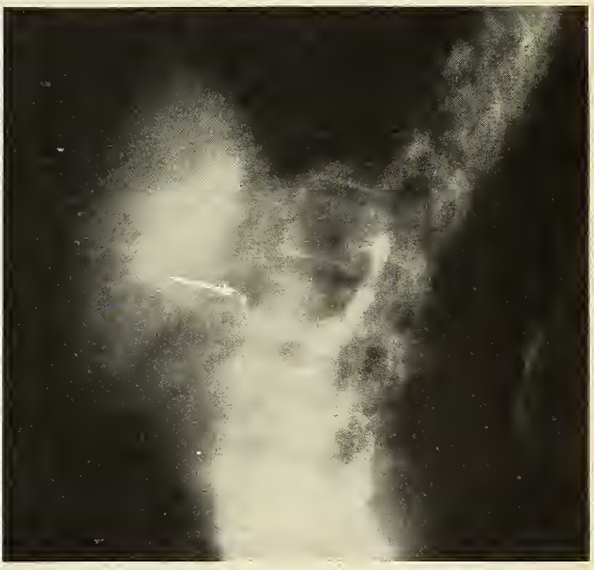


Fig. 12. Case 3 after reduction. Note correction of kyphosis as seen in Figure 11.

METHOD

The patient is given a preliminary hypodermic of sodium luminal, and then 100 to 150 milligrams of novocain dissolved in spinal fluid are injected intraspinally, and the patient placed upon an ordinary Hawley table (Fig. 1). The spinal anesthetic gives perfect relaxation and eliminates all pain. The feet are then fastened to the foot supports to obtain countertraction. The spine is protected by heavy pads of felt, then a heavy muslin bandage is fastened around the body directly over the injured vertebra, and the operator and his assistant lift this portion of the spine, thus creating hyperextension, and fasten the muslin to the horizontal bars directly above the patient (Figs. 2 and 3). With the patient in this position the operator then can create more extension and more gentle manipulation by locking his arms under the spine and under the arms of the patient. Gentle rocking of the spine from side to side and putting direct pressure over the injured vertebra aid materially. These can be done with absolutely no pain to the patient, and can be done very leisurely and with minimal effort. A plaster cast is then applied with the patient in the hyperextended position, care being taken to have the cast high on the chest and low on the pelvis, so that there may be three fixed points of leverage: high on the chest, low on the pelvis anteriorly, and directly over the injured vertebra posteriorly (Fig. 4). After the plaster cast is sufficiently dry and hard a large window may be cut over the upper abdomen to facilitate breathing. The patient is transferred from the Hawley table to bed, where he remains for approximately two months. During this time he may turn freely upon his side or upon his abdomen, but is not allowed to sit or stand. He is not even allowed into the semi-recumbent position until the two months are nearly up. Following the two months' period in bed a well fitting steel brace is made which keeps the spine in hyperextension and he is then gradually allowed onto his feet. The brace is worn for approximately six to nine months, during the latter portion of which period he is allowed to do practically all of his normal labor.

A precaution to be exercised should be noted: very careful scrutiny of the X-ray to discover or rule out a fracture of the lamina or lateral mass. If this were present and unrecognized serious damage to the cord might result. With great care, however, maintaining very strong traction, even a fracture dislocation can be corrected, as witness Davis' Case 7. Even more care must be exercised in those cases already exhibiting cord involvement, and only the thoroughly trained should attempt manipulation of these.

SUMMARY

1. A plea is made for earlier diagnosis of fractures of the vertebræ.
2. It is pointed out that compression fractures of the spine may be corrected so that the body of the vertebra can be returned almost to normal shape.
3. Holding the vertebra in this new position allows regeneration of bone so that there is no permanent disability.
4. The method consists of hyperextension.
5. Spinal anesthesia offers an excellent anesthetic.
6. The manipulation on the Hawley table offers an easy method of carrying out the manipulation.
7. Care should be taken to look carefully for fracture of lamina or lateral mass to avoid injury to the cord.

CASE REPORTS

Case 1.—H. U. M., 45 years of age, married, a banker by occupation, was in an auto accident March 23, 1930, in which his car went into a ditch. He felt a sharp pain in the back and was brought to St. Luke's hospital about 8 p. m. complaining of pain in the lower thoracic region.

Examination revealed no paralysis of the legs or arms and no disturbance of sensation. X-ray revealed a compression of the 11th thoracic vertebra (Fig. 5). He was placed on a fracture bed and given 10 gr. of veronal.

The next morning after a preliminary hypo of morphine (gr. ¼), a spinal anesthesia (using 150 mg. of novocain) was given, and the patient placed on a Hawley table. Hyperextension was accomplished by the method described above and a plaster-of-Paris cast applied (Fig. 6).

The patient remained in bed in the hospital three or four days and was then transferred by ambulance to his home. Considerable abdominal distress from distention lasted for about seven or eight days. He remained in bed at home for two months and then was allowed to get up gradually after a well fitting brace had been applied. The brace was worn seven months. X-ray examination in December showed bony replacement of the crushed trabeculæ (Fig. 7). No pain was experienced on motion. The patient was able to do his former work.

Case 2.—A. O., aged 31, married, a female, was injured in an auto accident June 20, 1930.

X-ray showed compression of the 12th thoracic vertebra (Fig. 8). No paralysis nor sensory disturbance resulted. The fracture was reduced June 21, 1930, under spinal anesthesia (150 mg. novocain). X-ray showed a good reduction (Fig. 9). Considerable abdominal discomfort lasted for five days. The patient remained in the hospital nearly three months. After two months the cast was replaced by a brace. X-ray in November showed good healing (Fig. 10).

Case 3.—T. J. H., aged 45, married, female, was pushed into a sitting position by an auto backing into her. She experienced a sharp pain in the back.

X-ray showed a compression of the first lumbar vertebra. No nerve injury was found (Fig. 11).

The patient was first seen on November 24, when the fracture was reduced and a cast applied under spinal anesthesia. There was moderate abdominal discomfort four days. Subsequent X-ray showed good correction (Fig. 12).

BIBLIOGRAPHY

1. Davis, A. G.: Fractures of the spine. Jour. Bone and Joint Surg., 11:133 (Jan.), 1929.
2. Dunlop, J., and Parker, C. H.: Correction of compressed fractures of the vertebræ. Jour. Am. Med. Assn. 94:89 (Jan. 11), 1930.
3. Rogers, W. A.: Extension frame for reduction of fractures of vertebral body. Surg., Gynec. and Obst., 50:101 (Jan.), 1930.
4. Wallace, J. O.: Crushing fractures of the spine. Jour. Bone and Joint Surg., 5:28 (Jan.), 1923.

RACIAL DIFFERENCES IN BLOOD PRESSURE*

HAROLD S. DIEHL, M.A., M.D.
Minneapolis

REPORTS over a period of several years have suggested differences in the blood pressure levels of certain races. Musgrave and Sisson[1] in 1910 found the mean systolic blood pressure of thirty adult male Filipinos to be 108 mm. of mercury. Chamberlain[2] in the following year examined 156 Filipinos between 15 and 25 years of age and found that they had an average systolic pressure of 114.7 mm. From this he concluded that the blood pressures of the Filipinos are practically identical with pressures of the whites. On the other hand, Concepcion and Bulatao[3] in 1916 studied the blood pressures of 362 male Filipino students and convicts between the ages of 15 and 30 years, and reported for the group, as a whole, a mean systolic pressure of 111.5 mm. and a mean diastolic pressure of 76.9 mm.

The Chinese also have been said by practically every writer to have blood pressures distinctly lower than the usually accepted standards for members of the white race. Tung[4] summarized some of the more representative reports of blood pressure studies on the Chinese in the table here reproduced.

TABLE I
BLOOD PRESSURES OF THE CHINESE

Author	*Part of China*	*Number of Subjects*	*Ages*	*Mean Blood Pressure*	
				Systolic	*Diastolic*
Kao (Nat. M.J. China) 8:101, 1922	Central China	63	21-25	116 mm.	71 mm.
Cadbury (China M.J.) 37:823, 1923	South China	700	15-30	101 mm.	65 mm.
Kilbourn (China M.J.) 40:1, 1926	West China	741	14-31	111 mm.	70 mm.
Ying (China M.J.) 40:641, 1926	East China	182	21-50	113 mm.	72 mm.

The mean systolic and diastolic pressures of the 1686 Chinese subjects included in these studies are 107.3 mm. and 68.2 mm. respectively.

Donisson[5] states that the blood pressures of the natives of Africa are practically the same as the pressures of whites in the temperate zone. His basis for this statement is the fact that in a group of 200 natives between 20 and 30 years of age in the interior of Africa he obtained a mean systolic pressure of 124.67 mm., and a mean diastolic pressure of 82 mm. His figures for older age groups were much lower, 200 cases between 50 and 60 years of age showing a mean systolic pressure of 108.1 mm. and a mean diastolic pressure of 71.8 mm. These lower mean pressures of the older group raise the question as to whether excitement may not have been an important factor in raising the pressures of the younger groups.

PRESENT STUDY

In order to further investigate the racial differences in blood pressure, the pressure of American born and foreign born male students attending the University of Minnesota have been analyzed. For the purposes of this analysis only students between 19 and 29 years of age have been included. All blood pressure readings were taken in the same manner and under similar conditions, but undetermined differences exist in the length of time which these students had been away from their native lands. For purposes of comparison, the pressures of a group of Chippewa Indians† of the same age and sex are included.

RESULTS

In Table II both median and mean pressures are shown, with the median listed first as the pressure most characteristic of the group. Age, height, weight, and percentage of standard weight, according to age and height, are included in the table because of the relationship which these factors frequently bear to the blood pressure.

---

*From the Students' Health Service, University of Minnesota.

†The blood pressures of the Indians were supplied by the Minnesota State Board of Health.

The median systolic pressures of students from the Philippine Islands, China, and Japan are the lowest of the groups studied. The pressures of the American Negroes are approximately the same as the pressures of the yellow races, the median being slightly higher but the mean slightly lower than for the Chinese, Japanese and Filipinos. Within the white race, several groups have been set up. Of these, the Eastern European Jews show a median pressure of 120 mm.; native born Americans, 120 mm.; and the Scandinavians, 122 mm. Highest of all were the American Indians with a median pressure of 128 mm. and a mean of 124.9 mm. To the Indians, of course, physical examinations were less of a routine procedure than to the University students; hence, it is very possible that greater excitement may have contributed materially to the high pressures exhibited by them.

The relations between the diastolic pressures of the several groups were similar to the relations between their systolic pressures, except for the Filipinos, whose systolic pressures were low but diastolic pressures relatively high. No explanation for this is apparent but the observation is in accord with the findings of others.[6]

The ages of the groups included in the study were sufficiently uniform to render age an unimportant factor as a cause for the differences in blood pressure. The differences in weight, and in the weight-height-age relationship of the several groups correspond in some instances to the differences in blood pressure; in others, however, this parallelism does not hold true. For example, the negroes have next to the lowest blood pressure with the highest weight-height-age percentage. This would make it appear likely that some factor other than size is responsible for the differences observed in the blood pressure.

COMMENT

These findings naturally raise the question as to whether there are true racial differences in blood pressure, or whether the differences observed are due to such conditions as climate, diet, habits of life, etc. Musgrave and Sisson[1] report that American soldiers in the Philippine Islands show a decrease of about 10 per cent. in systolic blood pressure over a period of several years. Foster[7] and Tung[4] report a similar drop in the blood pressure of Americans who have taken up their residence in China. On the other hand,

Table II

BLOOD PRESSURE OF STUDENTS FROM VARIOUS COUNTRIES

Native Country	Number of Cases	Mean Age in Years	Systolic Pressure Median mm.	Systolic Pressure Mean mm.	Diastolic Pressure Median mm.	Diastolic Pressure Mean mm.	Mean Height in Inches	Mean Weight in Pounds	% of Standard Weight
Philippine Islands	36	22.3±.4	112	116.5±1.5	78	77.4±1.2	63.7±0.3	114.7±1.3	90.8±0.7
China, Japan, Korea	28	22.3±.3	114	113.9±1.3	70	71.4±1.1	66.0±0.3	121.3±1.4	87.0±0.9
American Negroes	25	20.0±.4	115	114.0±1.2	72	73.2±1.0	66.9±0.3	137.0±2.8	102.4±1.8
Eastern European Jews	41	19.6±.3	120	119.4±1.1	73	72.7±0.9	65.8±0.3	131.7±1.5	100.1±1.0
American Students (White) (both parents born in U. S.)	542	20.3±.2	120	122.0±0.4	75	76.0±0.3	68.7±0.2	142.4±0.5	101.6±0.3
Scandinavian Countries	30	22.8±.4	122	122.5±1.2	78	76.8±0.8	68.7±0.4	147.3±1.7	97.8±1.0
American Indians	34	19.8±.7	128	124.9±1.2	80	76.6±1.1			

The standards used for weight according to age and height were those developed by the Medico-Actuarial Society of America.

Harris, quoted by Foster,[7] manager of the North China Division of the Sun Life Insurance Company, Shanghai, states that "in our experience the blood pressure of the Chinese is considerably lower than the blood pressure of the Caucasian races. The blood pressure of the white races, that is, the Europeans and Americans in China, is, however, in our experience, just the same as the blood pressure in such races in Europe and America. We are also of the opinion that hypertension in foreigners is just as common in China as in western countries and that hypertension is rare in the Chinese." Roddis and Cooper[8] found that the blood pressures of 173 American naval officers in the tropics were about 11.5 mm. below the level considered normal in the temperate zone; and Mukherjee[9] states that the basal metabolic rate of Europeans in the tropics is below European standards.

These decreases of metabolism and blood pressure in the tropics are believed by Roddis and Cooper to be due primarily to alterations in physical activities. Alvarez's[10] observation that the most typical systolic blood pressure of prisoners in a state penitentiary was 115 mm. of mercury and that the pressure did not exhibit the expected increase with age tends to support this theory. On the other hand, the observations here presented strongly suggests that when individuals of different races are living under the same or similar conditions there still exists a basic difference in the blood pressure level. It is entirely possible, of course, that the lower blood pressures of certain races may be the result of long continued differences in habits, customs, and modes of living.

SUMMARY

1. Differences exist in the mean and median blood pressure of certain racial groups of students at the University of Minnesota.

2. The Filipinos, Chinese, and Japanese exhibit the lowest median systolic pressures; the pressures of negroes were slightly, though not significantly, higher; while the Americans and the Scandinavians had the highest pressures of any of the student groups.

3. The relation of the diastolic pressures of the various groups is similar to the relation of the systolic pressures, except that the Filipinos with a low systolic pressure have a relatively high diastolic pressure.

4. A group of Chippewa Indians of the same age and sex as the University students, but examined under somewhat different conditions, had higher systolic pressures than any of the student groups.

BIBLIOGRAPHY

1. Musgrave, W. E., and Sisson, A. G.: Blood pressure in the tropics. Philippine J. Sci., 5:325 (Aug.), 1910.
2. Chamberlain, W. P.: A study of the systolic blood pressure and the pulse rate of healthy adult males in the Philippines. Philippine Jour. Sci., 6:467 (Dec.), 1911.
3. Concepcion, I., and Bulatao, E.: The blood pressure of Filipinos. Philippine Jour. Sci., 11:135 (May), 1916.
4. Tung, C. L.: Relative hypotension of foreigners in China. Arch. Ind. Med., 40:153 (Aug.), 1927.
5. Donnison, C. P.: Blood pressure in the African native. Lancet, 116.6 (Jan. 5), 1929.
6. Cadbury, W. W.: The blood pressure of normal Cantonese students. Arch. Ind. Med., 30:362 (Sept.), 1922.
7. Foster, J. H.: Blood pressure of foreigners in China. Arch. Ind. Med., 40:38 (July), 1927.
8. Roddis, L. H., and Cooper, G. W.: The effect of climate on blood pressure. Jour. Am. Med. Assn., 87:2053 (Dec. 18), 1926.
9. Mukherjee, H. N.: The basal metabolism of man in the tropics. Jour. Am. Med. Assn., 86:1384 (May 1), 1926.
10. Alvarez, W. C., and Stanley, L. L.: Blood pressure in six thousand prisoners and four hundred prison guards. Arch. Ind. Med., 46:17 (July), 1930.

SOME OF THE PRESENT METHODS USED IN THE DIAGNOSIS AND TREATMENT OF PROSTATIC HYPERTROPHY*

Gilbert J. Thomas, M.D., F.A.C.S., and E. W. Exley, M.D.
Minneapolis

MOST urologists and many surgeons recognize the necessity of preoperative treatment of the patient who requires prostatectomy, and are aware of the lower mortality since this treatment has been used. In a paper,[2] read before this society in 1927, we stressed the importance of careful preoperative treatment, and emphasized some phases of this technic.

We have never been satisfied with the mortality occurring during the preoperative stage of prostatectomy. When we add this to the present operative mortality, we find the total is not as low as it should be. We have apparently transferred much of our operative mortality of twenty years ago to a present-day preoperative mortality. Is there anything more that we, as urologists, may do to lower the morbidity and mortality of the patient with hypertrophy of the prostate, whether preoperative or operative?

Our discussion here will dwell upon our experience with additional phases of preoperative and operative technic that in our opinion have a direct relationship to morbidity and mortality.

The Necessity of a Careful Physical Survey Before Preoperative Treatment is Begun.—We have found a careful physical survey of the patient of great importance before any preoperative treatment is started. This has become a rule because from experience we know that in many instances our preoperative treatment would either not have been started, or would have been changed, had we known the findings of a complete physical examination. Excepting in emergencies, a patient with hypertrophy of the prostate should not have more of a urologic examination than the finger palpation of the rectum, urinalysis and X-ray before the results of a complete physical survey, together with blood chemistry and electrocardiogram, are known. Our internists know the difficulties that the sufferer with prostatic disease may have during his preoperative and operative treatment, and of the importance of discovering lesions before preoperative treatment is begun. Having this coöperation, we do not begin preoperative treatment until the physician assures us that the patient has no condition that may give rise to complications or contribute to morbidity or mortality. The internists are thorough in their search for foci of infection. They have taught us that a patient with any cardio-vascular lesion should have more careful and possibly more prolonged preoperative treatment than a patient with normal findings.

One of our internists warned us some six months ago concerning one of our patients who had some râles in the base of one chest cavity. We were told that this man might develop pneumonia following the slightest exposure to infection, and suprapubic drainage was suggested for a few months, during which time the lung condition might be treated. This advice was accepted, and three weeks ago we were able to remove this man's prostate, which was followed by an uneventful recovery.

The Role of Infection in the Preoperative and Operative Phases of Prostatic Surgery.—Infection in the epididymis still remains a troublesome complication during the preoperative and postoperative stages of prostate disease. A double vasotomy done before catheters or other instruments are passed through the urethra reduces this painful and distressing complication to a minimum. In a paper read at the last session of the American Urological Association,[3] we emphasized the role of infection in the production of mortality in patients suffering from prostatic hypertrophy with the following summary:

I. Any type of catheter drainage of the bladder may introduce infection into the urinary tract, and, by traumatizing the urethra, introduce infection into the blood stream, both of which conditions become a factor in producing mortality.

II. In 93 per cent of the autopsy records studied, old or recent urinary infection was a major factor in the production of death.

III. Cardiovascular disease without urinary infection was a factor in producing death in only 7 per cent of the cases.

---

*From the Department of Urology and Dermatology, The Nicollet Clinic, Minneapolis, Minnesota. Read before the seventh annual meeting of the North Central Branch of the American Urological Association, Indianapolis, Indiana, October 23–25, 1930.

IV. Bronchopneumonia was the cause of death in 46 per cent of the cases reported. In only two cases in this group did the autopsy findings fail to reveal evidence of a severe genitourinary infection.

V. Forty per cent of the total number of deaths occurred during the preoperative treatment.

VI. The average number of days of preoperative urethral catheter drainage was nineteen. No conclusion could be drawn from our study of the duration of a catheter drainage.

From experience we know that infection may reach the blood stream when a catheter or other instruments pass through the urethra. This additional hematogenous infection when carried to partially damaged kidneys has been sufficient to interfere with their function so that a fatal uremia has developed. For this reason we recognize the importance of the more careful handling of the over-distended bladder. In the treatment of this condition we believe that the methods used by many of us are not satisfactory. Many urologists are in the habit of using the indwelling permanent urethral catheter with gradual decompression to relieve chronically over-distended bladders. It seems to us that with this and other methods now being used little attention has been given to the proper control of infection.

Our study of postmortem material indicates that urinary infection is a primary cause of death much more often than embarrassment of kidney function, which follows as the result of pressure from an overdistended bladder, ureters and kidney pelves. However, both of these factors may operate to produce morbidity and mortality. Infection introduced into the blood stream is frequently carried to the kidneys. Here the infection finds the defense mechanism low because of interference from residual urine in the bladder, ureters and kidney pelves, so that inflammation with the production of chills and fever begins.

If preoperative treatment consisted in merely removing the residual urine so that back pressure on the upper urinary might be relieved, our problem would be solved and our preoperative mortality would be nil.

Over-distention lowers the resistance of the urinary tract, but we doubt that this condition alone may exist long enough to completely destroy the kidneys without infection. However, infection is more liable to occur with over-distion than without it.

We have been able to reduce our morbidity, and probably our mortality rate, by not attempting gradual decompression of the chronically over-distended bladder with the introduction of catheters through the urethra.

When we find a patient who has prostatic symptoms and palpable enlargement of the prostate, together with normal blood chemistry findings and slight residual urine with only a moderate infection in otherwise normal urine, we believe that repeated catheterization, and eventually a permanent catheter, may be used. In other words, we find some patients whose general condition is such that we believe their kidneys can withstand the amount of infection which may be introduced by the use of urethral catheters, either temporarily introduced, or for permanent drainage. We find it difficult, however, to judge the border line case that may withstand catheterization or may require suprapubic drainage. When in doubt, careful suprapubic drainage without contamination of the prevesical space should be done.

Examination of Urological Tract.—The urologist should make as complete a study of the urological tract as conditions permit. One cannot always be sure that the prostate is enlarged enough to produce symptoms by palpation per rectum alone. It may contain median and bilateral lobes which project into the bladder and are not palpable per rectum. In some instances it becomes necessary to differentiate between a prostate that is temporarily enlarged because of non-specific prostatitis, and an adenoma, or both. Occasionally we have found it necessary to use the cystoscope before this differentiation could be made. This instrument should not be used, however, until infection has been controlled, and not until drainage of the kidneys and bladder has been completed.

The cystogram will frequently give useful information concerning the size of the prostate and the bladder, and the presence or absence of diverticuli.

We find that many urologists do not watch the pus content of the urine carefully enough. Some method of calculating the number of pus cells per high power field should be used, so that we may know whether infection is increasing or decreasing. The constant occurrence of many pus cells in the urine after adequate drainage of the bladder has been established should direct suspicion toward the upper urinary tract. In a few instances we discovered pyonephrosis and pyoureter which required attention before prostatectomy could be undertaken. It is our opinion that the cystoscope, ureteral catheter and X-ray should be used with the prostatic patient just as they would be used in the diagnosis of any other urological lesion. Before the routine use of X-ray in examinations, large bilateral renal stones have been found which were present before and after prostatectomy.

When cystoscopy is contraindicated or impossible, the use of intravenous urography may give helpful information concerning the upper urinary tract.

To sum up, then, we believe that the preoperative treatment of patients suffering with hypertrophy of the prostate should aim at control of infection and the discovery of lesions in the urinary tract or in other organs which from an internist's point of view might be a factor in increasing morbidity or mortality. From our experience we believe that care in the evaluation of these two factors will materially reduce morbidity and mortality, particularly in the large group of patients who die before prostatectomy is undertaken.

Surgery of the Prostate.—After preoperative treatment has restored the patient's functions to normal, prostatectomy may be undertaken. Careful operative technic will eliminate hemorrhage as a postoperative complication. When the one-step so-called open operation (primary suprapubic prostatectomy) can be done, the control of hemorrhage is not difficult. In order that bleeding may not interfere with our careful enucleation of the prostate, we have been in the habit for the last fifteen years of injecting the prostate and prostatic capsule through a long needle with novocain or salt solution. This method has recently been described by Ballenger,[1] and we like to follow his technic. This controls bleeding so that we are able to see what we are doing at all times, and we have little difficulty in picking up bleeders and tying them when the enucleation is completed.

Careful trimming of the ragged bladder edge and subsequent sewing with interrupted stitches have been great factors in the control of postoperative hemorrhage. In addition to these safeguards, we are in the habit of using a rubber bag partially filled with water in the prostate bed. With this technic we have not had a postoperative hemorrhage during the last four years. We like to sew the bladder to the abdominal wall and attempt to repair the incision of the bladder, so that we have a water-tight opening around the drainage tube. As soon as the patient returns to bed following prostatectomy, antiseptic solutions are introduced into the bladder, which continue our fight against infection. This is continued even after the suprapubic wound is healed. Following the removal of the bag, we do not introduce a catheter through the urethra at once, because we still fear the possibility of carrying infection into the recently operated field. The suprapubic drainage tube is replaced every two or three days with a smaller one, and after the tenth or twelfth day a small catheter may be introduced through the urethra and all suprapubic drainage removed.

Nursing.—The proper care of patients with hypertrophy of the prostate requires the services of a male nurse who has been thoroughly trained and who has nothing else to do. We are sure this type of expert care reduces the patient's stay in the hospital at least a week, and reduces the time that he drains suprapubically from seven to ten days.

Anesthesia.—After trying several general anesthetics, we have come to rely on spinal as the anesthesia of choice for prostatectomy or cystotomy. Our second choice is hyoscin and morphine, plus infiltration both of the suprapubic area and of the prostate.

SUMMARY

1. Preoperative examination of patients suffering with hypertrophy of the prostate is of tremendous importance, and therefore must be very thorough, and every finding properly evaluated before the plan of preoperative and operative treatment is determined.

2. In the preoperative treatment of the prostatic patient the urologist's aim should be to control and relieve infection in the urinary tract.

3. Infection present in the urinary tract, together with that introduced by instrumentation, causes a bacteremia which is responsible for the majority of deaths occurring during the treatment of these patients.

4. The fight against urinary infection should be continued during postoperative convalescence and until the patient is returned to normal health.

5. The type of anesthetic to be used should be chosen to fit the patient. Our experience teaches us that spinal or hyoscin and morphine hypnosis, plus infiltration, are the best methods.

6. The technic of surgical removal of the prostate should be directed to the control of hemorrhage. We believe that this may be best accomplished by a technic that permits the surgeon to view the field.

7. The services of a specially trained male nurse are invaluable in the care of the prostate patient.

REFERENCES

1. Ballenger, E. G. (et al.): Further report on use of periprostatic infiltration with local anesthesia for suprapubic prostatectomy. Brit. Jour. Urol., 1:390 (Dec.), 1929.
2. Thomas, Gilbert J., and Exley, Erwin W.: Some points in the technic of preoperative and postoperative treatment of non-malignant hypertrophy of the prostate. Minn. Med., 11:297 (May), 1928.
3. Thomas, Gilbert J., Exley, Erwin W., and O'Brien, W. A.: Causes of death following treatment for the relief of prostatic hypertrophy. Jour. Urol. (March), 1931.

CASE REPORTS

TRAUMATIC APPENDICITIS*

REPORT OF CASE

Willard D. White, M.D.
Minneapolis

Not long ago I was present at an autopsy which was performed on the body of a young man who received an injury to his abdomen and who had subsequently developed appendicitis, peritonitis and died. The history was that this man had apparently been well until September 30, 1929, when, while cranking an auto truck, the engine back fired and the handle of the crank struck him in the abdomen so that he complained of pain to a fellow workman who was with him at the time. They eventually got the motor started, and he drove the truck a number of blocks and left it at his destination. He went home and complained to his wife that he had pain in the abdomen. He sat down to dinner, ate very little and, although there was company at his house for dinner, he went to bed very soon after the meal, stating that he did not feel well. He vomited early in the evening and slept very little during the night. The next day his pain became more severe but gradually subsided. A physician was called who obtained the history as just outlined, examined the patient and stated that in his opinion the man was very likely suffering from appendicitis but that he probably was over the worst part of the attack and that he probably would recover without operation.

On October 4, four days after the blow on the abdomen, the same physician was again called and found that the symptoms were much worse. He had the man sent to the hospital and operated on him the same evening, and found a gangrenous appendix incompletely walled off and a small amount of pus. The appendix was removed and drains were inserted. On entrance to the hospital his temperature was 100.8, pulse 108. From the fourth postoperative day on there was an increase in the temperature and pulse rate, he was irrational at times and he died on October 13, 1929, fourteen days after the accident and nine days after his operation. He was buried. Later the question arose of the relationship of the blow on the abdomen to the development of his appendicitis and death, and an autopsy was performed on November 23, 1929, about six weeks after his death. Definite evidence of peritonitis was found. There was no dispute about the fact that he had appendicitis and peritonitis. Apparently there was no question about the fact that he received a blow on the abdomen which caused him to complain, nor that he was feeling well up to the time he received the blow and that symptoms began soon after.

I have asked a number of men of considerable medical and surgical experience their opinions about traumatic appendicitis and whether they had seen such cases. The usual reply has been that the appendix was such a mobile and well protected viscus that it is very rarely traumatized unless some extreme force or crushing blow does such extensive damage to the abdominal wall and trunk that the appendix is included with other tissues damaged by the force. On looking up the literature I found that traumatic appendicitis is by no means such a rare condition and many cases are cited where an apparently healthy individual receives a blow on the abdomen and promptly develops appendicitis.

It is true that the appendix is a deeply situated and mobile organ and that this location and mobility are protecting factors against direct trauma. It appears, however, that traumatic appendicitis results from a blow on the abdomen which involves certain other factors.

The lumen of the appendix is continuous with that of the cecum and the contents of the bowel enter the appendix freely, remain there for a time and then are expelled into the cecum. The cecal and appendiceal contents are at all times laden with bacteria capable of invading the appendiceal wall under favorable conditions. We know from observing patients who have been given a barium meal or enema under the fluoroscope that with relatively slight pressure material can be forced from the cecum into the appendix. It may remain for a few moments, hours or for several days.

Experimenters (Furbinger and Von Hansemann) were able to express the contents of a full cecum into the appendix by light manual pressure over the cecum, by light manual pressure over the ascending colon and by introduction of air into the rectum. They used colored fluids as an indicator.

Let us now consider what may happen if a blow is received on the abdomen sufficient to cause a violent contraction of the muscles and increase the intra-abdominal pressure. Several things may happen as far as the appendix is concerned.

1. The bowel content may be forced into the appendix sufficiently to produce a moderate distention of the appendix but the elasticity of the appendiceal wall forces the bowel material back into the cecum, when the pressure decreases and no untoward effect is noted.

2. The force may be sufficient to distend the appendix beyond its physiological limit, producing minute cracks or tears in the lining of the appendix and these allow the bacteria which are always present in the lumen to invade the wall of the appendix and produce disease.

3. The force may be sufficiently strong to produce

---

*Read before the Minneapolis Surgical Society at its meeting of March 5, 1931.

not only cracks in the mucous membrane or muscle coats but it may actually cause a rupture through the wall of the appendix allowing immediate spilling of the bowel content into the peritoneal cavity.

4. Let us now consider what may happen in an appendix in which a fecalith is present which is too large to be expelled through the ileocecal valve. The bowel content is forced into the appendix and the muscle of the appendiceal wall attempts to force the fecal material back into the cecum but the opening becomes obstructed by the fecalith. If the material is now confined within the appendix under pressure, a stasis results. These conditions favor the growth of bacteria. Pressure is developed further, the resistance of the mucous membrane is damaged more and invasion of the wall is greatly favored. If the appendix has been the seat of previous attacks of inflammation which have caused kinking of the appendix and the formation of adhesions, these factors will make it even more difficult for the appendix to be emptied. As the pressure in the lumen of the appendix increases, distension follows. The circulation in the wall of the appendix is progressively impaired. Perforation is very apt to occur.

Another factor of importance is that a fecalith or coprolith is evidence of a pre-existing inflammation in the appendix. It is formed in that stage of the inflammation when the secretions are increased and it is made up of fecal material mixed with bacteria and inspissated mucus. Later this material becomes drier and hardens by chemical change and absorption. The mucosal crypts may be flattened out by contact with it. Aschoff[8] states that the primary or most active focus of infection is just distal to the coprolith.

As Ludington gives them: The conditions favorable for the development of a traumatic appendicitis are: (a) having the lumen obstructed by a coprolith; (b) fecal stasis in and defective drainage of the distal segment; and (c) an increase in the virulence of the contained organisms due to their confinement. When these conditions are present, if an excess of fecal contents is forced into the appendix it must either push the coprolith farther into the appendix or flow over and around the obstruction, filling and distending the terminal segment. Quoting from Ludington: "The immediate result of the afflux of cecal contents is pain from the distension of the appendix and from its efforts to empty itself. The distended appendiceal wall is rendered anemic by pressure, particularly in its mucosal layer. The virulence of the organisms is heightened by the establishment through the fecal stasis of conditions favorable to their development. These factors eventuate in an immediate and destructive invasion of the appendix wall."

The danger of active purgatives in appendicitis is recognized and Berkley Moynihan's alliterative sequence of pain, aperient, perforation represents the same mechanism as that obtained in a traumatic case, but substitutes as the propelling force the hypermobility of the stimulated intestine in the place of direct external pressure.

It will be seen, therefore, that the mere fact that a blow applied to the abdomen does not cause traumatic appendicitis by actual bruising of the appendix itself but causes it by overdistention of the appendix by increasing the pressure within the cecum, forcing the material into the appendix. It is apparent and readily admitted that this forcing of the cecal content into the appendix occurs a great many times and no appendiceal disease follows, but when conditions are right a blow on the abdomen can and does instigate an attack of appendicitis. The fact that trauma can and does play an important rôle in the production of appendicitis should be appreciated by medical men. Indeed careful reading of the literature shows that it is appreciated and recognized.

Howard A. Kelly wrote a book on "The Vermiform Appendix," published in 1905, and devotes considerable space to traumatic appendicitis and gives an outline of the history of fifty cases. These cases included individuals from two to forty-nine years of age. As one would expect, males were much more frequently affected than females, forty-one being males, and eight females. The sex was not mentioned in one case. It is interesting to note that in his fifty cases there was no evidence of external violence to the abdomen such as contusion or laceration in any instance. There was evidence of previous morbid condition in the appendix in thirty of his fifty cases.

Osler[7] states that persons whose work necessitates the lifting of heavy weights seem more prone to the disease and that trauma plays a very definite rôle and that in a number of cases symptoms have followed very closely a fall or a blow.

John B. Murphy[3] states that as early as 1892 he had called attention to the fact that trauma was occasionally an exciting factor in appendicitis and recognized that if the lumen is obstructed by fecal concretions the circulation of the wall of the appendix could be interfered with.

Ludington's[5] three cases were interesting. One was in a ten-year-old girl who fell from a swing, a distance of about two feet, and landed prone on level ground. Pain was immediate and severe. Vomiting followed and eighteen hours after the fall all the symptoms of peritonitis were obvious and operation thirty-six hours after the fall disclosed an appendix acutely angulated at its mid-point by a single firm adhesion. Immediately distal to the point of angulation an actively advancing peritonitis was present. His second case was that of a boy, nine years of age, who was enjoying the first sliding of the winter by "belly flopping" on a sled. He abandoned his sport on account of abdominal pain. Vomiting followed, and seventy-two hours afterwards a gangrenous appendix, containing a coprolith, was removed. His third case was that of a girl, nineteen, who thought she might have had appendicitis on account of pain in the right lower quadrant which recurred at intervals. She was examined carefully, her abdominal wall was thin, and deep palpation in the right lower quadrant failed to reveal evidence leading to a diagnosis of appendicitis. She was advised to go home and take a laxative, which she did, but on leaving the office she stated that the examination caused aching in the right lower quadrant. The ache grew worse and at 5 a. m., sixteen hours after the examination, the appendix perforated and at operation, later, a perforated appendix which contained a coprolith was found.

Addison H. Bissell[2] reports four cases. The first case was in a fourteen-year-old boy who had not had a previous attack of appendicitis. While playing football he fell forward striking his abdomen on a rock. He felt severe abdominal pain immediately and vomited. The abdominal pain was severe at first but lessened somewhat after an hour. It was, however, constantly present up to the time of the operation the day following the accident, at which time the wall of the cecum was injected and thickened. The right iliac fossa was the site of a large abscess and free in this abscess was a fecalith. The appendix was long, its distal half was necrotic and near the tip was a perforation, one inch long, opposite the attachment of the mesentery. The second case was in a ten-year-old boy without any previous history of appendicitis, who received a severe kick in the abdomen while playing football. He felt immediate abdominal pain, was nauseated and vomited. He felt pain in the upright position and was chilly. He was kept in bed at home for six days without being seen by a physician and he suffered constantly from severe abdominal pain and nausea, vomiting, chills, distension and constipation. On the sixth day he was sent to the hospital by a physician and operated upon immediately, and marked generalized fibrinopurulent peritonitis was present. Near the tip of the appendix was a perforation, one inch long, with markedly thickened everted edges. A large concretion was found in the part near the perforation, which was on the external lateral aspect of the appendix. Case 3 was that of a nineteen-year-old boy who had not had any previous attack of appendicitis. Forty hours before operation he had been thrown on his back while wrestling and his opponent had jumped on his abdomen. He felt immediate colicky abdominal pain, he was nauseated and vomited. At the operation the appendix was found to be four inches long, in normal position and not adherent. The entire appendix was markedly inflamed. The distal half was necrotic. There was a perforation, one inch long, near the tip of the anti-mesenteric side. A general peritonitis was present without the slightest evidence of any walling off. He did not show any improvement after his operation and died on the third day. Two concretions were found in the region of the appendix. Free purulent material filled the abdominal cavity.

Case 4. A boy, aged 18, who had not had any previous attacks of appendicitis, fell hard while skating, striking his buttocks. He felt pain immediately around the navel and in the right lower quadrant. He felt faint and chilly, was nauseated, and vomited. He was first seen by Dr. Bissell twenty-six hours after his fall and an appendectomy was immediately performed. A general peritonitis was present. A large abscessed cavity was observed in the right lower quadrant and a concretion was found in this cavity. The appendix was 2.5 inches long, its wall thickened and necrotic. Near the tip a perforation, one inch long, with everted edges was found.

Dr. Richard J. Behan[1] of Pittsburgh reported a case in a young man, twenty-eight years old, who fell over a tomato patch, landing on a sewer crock, inflicting a bruise on the left side of the abdomen. From this time on he had severe pain in the abdomen which was more or less constant. After the first severe onset the tendency was for the pain to be localized in the right side. Three weeks after this first injury he had a sudden exacerbation of pain in the abdomen with nausea, weakness and general malaise. Operation revealed a large abscess in the region of the appendix with the cecum firmly bound down to the lateral peritoneal wall and over 400 c.c. of dark foul liquid was removed from the peritoneal cavity, by means of the suction apparatus.

No attempt will be made in this article to collect all of the cases of traumatic appendicitis reported in the literature, but many cases are encountered where a blow on the abdomen is followed almost immediately by symptoms which we ordinarily recognize as those of appendicitis and subsequent operation has revealed a gangrenous appendix, and in a great many of these cases fecal concretions are obtained.

The relationship of trauma to the abdomen with a subsequent development of appendicitis is of importance not only in a general medical way but also from a medico-legal standpoint as well. Of course, it is a well known fact people are very prone establish a connection between any disability and an accident which may furnish a possible cause for it and this is especially true if the question of compensation or liability enters into it. It is a common thing to see patients who will ascribe the production of a tumor of the breast or abdomen to a bruise or fall and if the patient has pain in his extremities which might be due to a rheumatism or neuritis it is not unusual to have such a patient give as his opinion that the symptoms were present because some accident had happened to him at some time or other. This factor is well recognized. Nevertheless, we must also admit that there is such a clinical entity as traumatic appendicitis "and that such testimony to that effect must be given, when the facts warrant it, with assurance, whether it be for or against an individual or association."[4]

"To argue as to whether the organ was normal or not is beside the point, for the abnormalities that make for easy invasion of the appendix by infection after injury are compatible with good health, and the question should be whether an abdominal injury, or unusual strain, precipitates the clinical picture of acute appendicitis. There does not need to be any doubt that this can take place. The trauma is the deciding factor." (Bissell.[2])

Another important factor to be considered is that when the appendix has been removed and is examined in the laboratory it is impossible to state whether or not this appendix which might be gangrenous and perforated was a traumatic appendicitis. One's opinion in that regard is formed on the careful history which describes the circumstances immediately preceding the events and condition of the patient immediately preceding the trauma and accurate description and understanding of what occurred at the time that the trauma was received, the time relationship between the trauma and the onset and development of symptoms and finally the findings at operation. All of these factors are taken into consideration in forming that opinion as to whether or not the case in question is one of traumatic appendicitis.

I do not claim to bring forth anything new or original in this discussion but my reason for bringing up the subject is to call attention to the fact again that there is such a thing as traumatic appendicitis and it is our duty to recognize it.

REFERENCES

1. Behan, Richard J.: Ann. Surg., 85:363, 1927.
2. Bissell, Addison H.: Arch. Surg., 17:672, 1928.
3. Keen: Surgery, 4:736, 1916.
4. Kelly, Howard A.: The vermiform appendix and its diseases. S. B. Saunders, 1905, 811.
5. Ludington, Amos L.: Jour. Am. Med. Assn., 80:14 (May 19), 1923.
6. Quoted by Ludington, Aschoff, L.: Pathologische Anatomie, Ed. 3, 1913.
7. Osler, William: Practice of medicine. Ed. 8, 1916.

CONGENITAL INTESTINAL OBSTRUCTION

REPORT OF CASE

Fred H. Stangl, M.D.
St. Cloud

Symptoms of bowel obstruction, seen within the first few days of life, are, almost without exception, due to congenital maldevelopment of the gastrointestinal tract. It is true that intussusception in the new-born takes place, as shown by the reports of Gelston and Sappington (1) and Steele (2), but this is most unusual. Of the mal-developments, imperforate anus is four itmes as frequent as all other atresias, according to Davis and Poynter (3), and is very easily recognized and surgically cured. Anomalies of the intestines proper are less frequent and Miller (4) gives their occurrence as one in every 15,000 to 20,000 births. Anatomically the duodenum, the ileum, the jejunum, or colon, are the usual locations; of these the frequency is shown by the following tabulation of Davis and Poynter (3):

	Cases
Duodenum, above the papilla	59
Duodenum, below papilla	75
Jejunum	66
Ileum and cecum	101
Colon	39
Multiple atresia	67

Numerous causes have been given for these atresias. Tandler (5) and Forssner (6) maintain that failure of epithelial plugs to canalize is the cause and the former has demonstrated such a plug in the duodenum of fetuses of four to ten weeks. Vascular sclerosis or anomalies are believed by Davis and Poynter (3) to result in atrophy and fibrous replacement of developing intestine. Other theories include fibrosis following volvulus, intussusception, anomalous peritoneal bands, and the healed fetal peritonitis reported by Fielder (7).

Symptoms usually do not appear until the infant begins to take food, but excessive abdominal distension and the passage of pale or lanugo-free meconium may be present to suggest intestinal obstruction. Vomiting soon appears. Varying with the location of the obstruction, this begins a few hours after nursing in high obstruction or is delayed for hours in lower obstruction. Occlusion below the papilla results in bile-stained emesis. Blood also may be present. Vomiting is persistent and inanition rapidly ensues. Constipation and obstipation are important symptoms. Meconium may be found if the obstruction is above the opening of the bile duct, but usually true lanugo-containing meconium is not present. Abdominal distention is usually noticeable from birth. Urine is scant and dark colored. Loss of weight is rapid and by the third day the infant's condition is grave.

This pathologic condition may involve any part of the intestine and atresias are often multiple. Duodenal lesions are usually single, and most of them are below the papilla according to Grulee and Bonar.[8] Obstruction may be due to a membrane only, the blind ends may be joined by a cord, or, more rarely, they may be completely separated. At the place of atresia, the proximal intestine terminates in a greatly distended blind sac, with hypertrophied walls.

The diagnosis of atresia of the intestine is usually easy from the symptoms and the demonstration of a blind gut by barium feeding and X-ray.

The treatment is essentially surgical. The prognosis is practically hopeless and reports of only six cases of successful operation for intestinal atresia were found. The first was in 1911 by Tockens,[9] who performed a lateral anastomosis for atresia of the ileum on an infant eight days old. In 1916, Ernst[19] performed a duodenojejunostomy for atresia of the distal half of the duodenum with survival of the patient. Richter[11] of Chicago mentions an infant having atresia at the duodenojejunal angle which he cured by posterior gastroenterostomy. In 1927, Sweet and Robertson[12] reported a patient treated by them on its ninth day of life for atresia of the first portion of the jejunum by gastrojejunostomy. The relief obtained was only partial. At the end of three weeks at a second operation, anastomosis between the dilated duodenum and jejunum was performed with full recovery. Bolling[13] reports two patients having atresia of the duodenum who were well following gastrojejunostomy.

The case reported herewith concerns a male baby, the fourth child of healthy parents, born spontaneously one month prematurely, after but a few hours' labor. No external deformities were present; breathing, heart action, and crying were normal. The birth weight is reported as 5.75 pounds. Birth occurred at 12:15 o'clock p. m. on April 17, 1931, in the family farm home. About forty-eight hours after birth, the family reported that the infant vomited all its food at infrequent intervals. They were instructed to bring the child to the hospital, where it weighed 5 pounds and 1.25 ounces, or 2,295 grams, upon admission at 6.45 p. m. on April 19, 1931, and measured 19 inches long. The skin was dry, slightly icteric and the child looked very sick. The temperature was normal. Urine was dark colored and scant. The bowels moved twice a day but only a small amount of slightly green mucus was expelled. Food was taken greedily. The abdomen was distended and tympanitic. Vomiting occurred once about every sixteen to eighteen hours during the life of the infant. Feedings of a half ounce of breast milk were given seven or eight times a day.

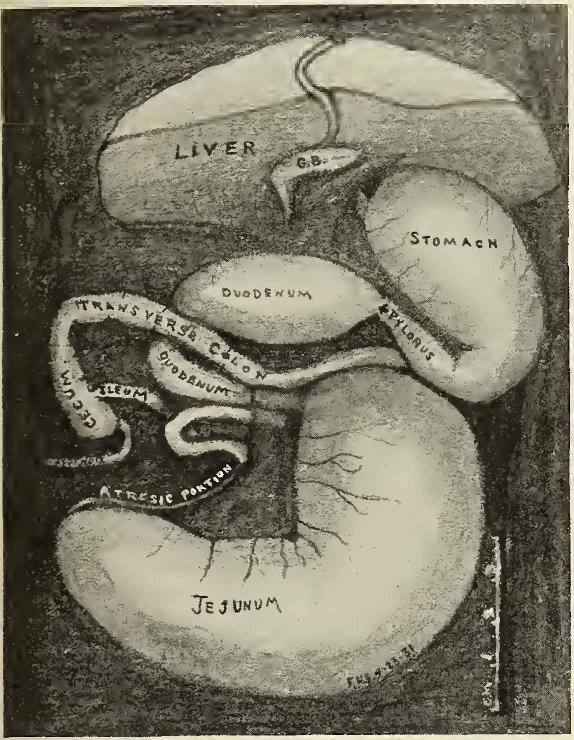


Fig. 1. Illustration is a retouched tracing of the viscera removed at postmortem examination. Atresia due to a 4 cm. fibrous cord of the jejunum with dilation of the intestine and stomach above the obstruction is shown.

X-ray examination revealed a stomach filled with an opaque meal which moved through a dilated duodenum into a very large blind pouch. Diagnosis of congenital obstructive lesion was made by Dr. W. L. Freeman, the roentgenologist.

The infant's condition was poor at all times; therefore surgery was not attempted. The child lived a little over five days, and at death it was deeply jaundiced and weighed 1,910 grams. Essential postmortem findings were a distended stomach and duodenum with a greatly dilated first half of the jejunum, which ended in a blind sac. From this it extended as a solid fibrous cord, 2 to 3 mm. in diameter, for 4 cm.; at this point the patent intestine was again present and continued to be so to the anus. The accompanying illustration is a retouched tracing of the removed organs showing the atresic cord and the general anatomical relations. The mesentery of the atresic cord was practically avascular, giving weight to the opinion that the maldevelopment might be the result of vascular anomaly.

Conclusion.—Congenital atresia of the intestines is relatively infrequent and cases of surgical cure are very few. A case of fibrous atresia of the second portion of the jejunum with postmortem findings and illustrative drawing is reported. Vascular anomaly is a likely cause of the reported case.

BIBLIOGRAPHY

1. Gelston and Sappington: Arch. Ped., 47:187, 1930.
2. Steele: Bull. Lying-in Hosp. N. Y., 2:56, 1918.
3. Davis and Poynter: Surg., Gynec. and Obstet., 34:35, 1922.
4. Miller: Surg. Clin. No. Am., 2:133, 1931.
5. Tandler: Morph. Jahrb., 29:187, 1900.
6. Forssner: Anat. Hefte., 34:1, 1907.
7. Fielder: Arch. f. Heilk., 6:78, 1864.
8. Grulee and Bonar: Monag. Newborn Diseases and Abnormalities, 1926 (Appleton).
9. Tockens: Zentralbl. f. Chir., 532, 1911.
10. Ernst: Brit. Med. Jour., 1:664, 1916.
11. Richter: Abt's System Pediatrics, 1926.
12. Sweet and Robertson: Arch. Dis. Child., 2:186, 1927.
13. Bolling: Monog. Surg. Childhood, 1928 (Appleton).

TETANUS FOLLOWING INDUCED ABORTION.

REPORT OF CASE WITH RECOVERY

C. H. Mattson, M.D., and T. A. Starkey, M.D.
Saint Paul

TETANUS following induced abortion is a very rare condition. The mortality reported in the literature is very high. Schneider,* in a survey of the literature, found the mortality of 111 cases of puerperal tetanus to be 91 per cent. We, therefore, think it justifiable to report this case.

The patient, a woman, aged 33, white, entered Ancker hospital May 4, 1931, complaining of inability to open her jaw, difficulty in swallowing, and stiffness and pain in her neck. These symptoms, first noticed on May 1, three days before admission, had grown progressively worse until at the time of admission she was unable to take even liquids by mouth, and her upper dental plate could not be removed.

At this time the patient stated that on April 28, 1931, three days before the onset of symptoms, a very small splinter from a broom handle had become lodged in the little finger of her right hand. This broom had never been used outside of her kitchen, and because of the size of the splinter (it measured 3/16 of an inch in length) and the absence of reddening, exudation and any other signs of local reaction, a search was made for another primary focus of infection. None could be found, though a foul smelling, sanguinous vaginal discharge attracted attention. At the time of admission the patient absolutely denied any irregularity in her menstrual cycle. However, a few days later she volunteered the following additional history: Her last normal menstrual period had terminated on January 28, 1931. She admitted having sexual intercourse during the first part of February and had missed her February and March periods. On about April 15th, thinking she was pregnant, she went to a midwife, who introduced a rubber catheter into the uterus. This was removed in twenty-four hours, following which she had a few cramps and within a day or two passed a liver-like mass. There had been no chills or elevation of temperature, though the foul, sanguinous discharge noted on admission had been present since then.

---

*Medizin, Klinik, Jan. 22, 1926.

This abortion was performed approximately two weeks before the onset of her first symptoms.

The patient also stated that during the month of March and the first week in April a pink rash had been present over the skin of her back, chest and abdomen. It disappeared spontaneously.

There was nothing else of interest in her past history except for tuberculosis in her mother, who is now a patient in the tuberculosis ward. The patient herself had had pleurisy several times in the past two years, and is now being observed for other evidences of tuberculosis, which as yet have not appeared.

Physical Examination.—On admission, the patient was an undernourished white female, with a temperature of 100°, a blood pressure of 112/60, and a rapid, regular, full pulse. She had a rather set expression to her face. Her jaw was held tense, almost completely closed, with the corners of the mouth drawn slightly back and upwards. Slight wrinkling of the forehead was present. Her upper dental plate could not be removed. There was moderate neck rigidity with pain in the upper spine on attempted flexion of the neck. Her biceps, triceps, patellar and achilles reflexes were all equal and markedly hyperactive. Ankle clonus was present bilaterally. Kernig's sign was positive. Babinski's sign was negative. The previously mentioned sliver was present, lodged in the epidermis of the fifth finger of her right hand. There was no evidence of infection or local reaction. The foul-smelling vaginal discharge was noted, but pelvic examination revealed nothing excepting slight enlargement of the uterus. There were no other positive physical findings.

Laboratory Findings.—The urine was negative. The blood was negative except for a 4 plus Wassermann reaction. The spinal fluid on first examination showed a 4 plus Wassermann. Pressure varied greatly from time to time, and after administration of antitoxin the globulin content increased to 3 plus at one time, and the cell count, also variable, rose as high as 1,800 per cu. mm. Colloidal gold determinations showed a slight rise in the last four tubes. Culture of the spinal fluid showed no growth.

Treatment.—Nutrition was maintained by nasal tube feedings of eggs, milk and sugar two or three times daily. The sedatives used were morphine in quarter grain doses every four hours for the first few days, and chloral hydrate in doses of from 20 to 30 grs. with each nasal feeding. The specific treatment consisted of massive doses of tetanus antitoxin. Spinal drainage followed by intraspinal injection of 20,000 units of the antitoxin was done daily for ten days. Intravenous injection of 10,000 units was done daily for seven days, and a total of 14,000 units was given intramuscularly about every third day. Thus, a total of 272,000 units of antitoxin was administered over a ten-day period.

Progress.—During the first forty-eight hours in the hospital the patient ran a progressively down-hill course. Her jaws became completely locked, the sardonic grin more marked, and her lips and nails became definitely cyanotic. All the muscles of her body were involved in a generalized hypertonicity. Her spine assumed the position of opisthotonos, her neck became very rigid, and her arms and legs became almost completely paralyzed, manifesting a lead-pipe spasticity. Her fingers remained extended and spastic. There were frequent jerkings and twitchings of all the muscles, especially those of the spine, causing considerable pain. This symptom was fairly well controlled by morphine and chloral. The reflexes became more hyperactive, almost to the point of clonus. However, from the third to the seventh day after her admission, improvement was slow but progressive, and at the end of a week the general rigidity had greatly diminished. The patient was then able to open her jaw sufficiently to allow the removal of her upper dental plate, and was able to swallow a liquid diet fairly well. Jerking and twitching with pain in the spine were still present at times, but of lessened severity. The neck rigidity and opisthotonos had improved greatly. All these symptoms and signs gradually improved until on the 22nd of May, 18 days after admission, the patient was back to a practically normal condition, with the exception of weakness and a slight stiffness of her knees and elbows on extreme extension. There was no evidence of residual paralysis, and her jaw could be opened to a practically normal degree. There was nothing characteristic about the temperature, which varied from 100° to 104°, and persisted for twelve days.

Complications.—On the seventh and eighth days after admission the patient complained of abdominal cramps, which were relieved in both instances by atropin and enemata. On the ninth day after admission she complained of pain in her right lower chest, worse on deep inspiration. A definite friction rub was heard over this area, with diminished breath sounds. This cleared up in twenty-four hours with no special treatment. On the tenth and eleventh days after admission she developed a toxic psychosis, with very vivid delusions of persecution. She made a complete recovery from this psychosis within forty-eight hours. Convalescence was otherwise uneventful.

Discussion.—We believe the induced abortion was the etiological factor in this case, because, with the exception of the sliver, no other possible portal of entry could be discovered, either by physical examination or from the history. We feel that the short time interval between this sliver injury and the onset of symptoms (three days) as well as the insignificance of the injury ruled it out, whereas the time interval between the abortion and the onset of symptoms (fourteen days) is a reasonable incubation period. Also, the evidences of infection in the uterus lent credence to this view.

We believe the chief point of interest in this case was the fact that cure was effected by massive doses of tetanus antitoxin alone, without the use of other advocated curative measures.

Ancker Hospital,
Saint Paul.

BISMUTHOIDOL NOT ACCEPTABLE FOR N.N.R.

The Council on Pharmacy and Chemistry reports that in 1926 Les Laboratoires Robin, Paris, France, requested acceptance of Bismuthoidol, which was stated to be colloidal bismuth in isotonic solution. The product is distributed in the United States by E. Fougera & Co., New York. The Council examined the submitted evidence and informed the proprietors that it was insufficient to establish the claims advanced for the product. In 1930 E. Fougera & Co. again requested consideration of Bismuthoidol. The Council examined the further evidence which was submitted and informed E. Fougera & Co. that Bismuthoidol is at present unacceptable for New and Non-official Remedies because the submitted advertising shows that, if accepted, its acceptance would be used to advertise unaccepted products and because the claims made for the product are unwarranted. The Council's report calls attention to the fact that, while the Council holds the intravenous administration of bismuth preparations unsafe, Bismuthoidol is used intravenously. (Jour. A. M. A., June 20, 1931, p. 2104.)

USE OF SALINIZED WATER IN INDUSTRY

At the present time salines are regarded as preferable to dextrose in the prevention and treatment of factory cramps due to excessive loss of fluid and salines through sweating. Both prevention and treatment of cramps are well abetted by the intake of dilute saline solutions to compensate for loss through sweating. It is, however, undesirable that tablets of salts be taken into the body as such. It is better that the entire water supply be treated with salt to the extent of 1 per cent. A strength from 0.3 to 0.5 per cent, being more palatable, may lead to more extensive use, especially if kept at a temperature from 47 to 52 F. (Jour. A. M. A., June 13, 1931, p. 2055.)

PRESIDENT'S LETTER

I HAVE been wondering what impression Will Rogers' statement, that the American mother would be safer in India than she is here at home, has made on the American public.

Such bombshells as this are thrown at us every once in a while. They may be facts and they may not. But a statement from Will Rogers is likely to be very extensively read and very extensively believed anyhow.

That being the case, I feel very strongly that the State Association, through the American Medical Association, should investigate the matter carefully. It occurs to me that there may be a question of reliability of statistics in this comparison with Mother India. But we ought to know, anyhow, whether we are dealing with facts or dramatic rumors. We ought to know whether it is a fact, as rumor has it, that 16,000 mothers die in America in child-birth every year, 10,000 of whom, at the very least could have been saved.

If it is indeed a fact, then a grave responsibility rests upon the physician in active practise and not upon the physician alone. Surely ignorance of such fundamental laws of health and hygiene as are involved in seeking adequate prenatal care, is also the problem of the school, the church. I can see no reason why such education should not be included in our high school curricula. Neither we, the physicians, nor the educators, nor the clergy are doing all in our power to correct this sorry situation unless we are also doing everything in our power to educate that unfortunate 10,000 before it is too late. If we are not, then we must accept the just indignation of the public as no more than our due.

I am sure no conscientious physician feels other than keenly responsible for the welfare of his own clientele. He should extend that feeling of responsibility beyond the confines of his own group and his own town. He must see that his efforts do not cease until schools, churches, every agency of public welfare, are not only teaching the imperative necessity of prenatal care but teaching it properly and authoritatively. It is actually a disgrace to every intelligent American, no matter what his trade or his profession, that mothers should still be sacrificed to ignorance in this enlightened land.

Some good might be accomplished, I should think, if the local county medical society made an official point of the matter. An official message through the newspapers of each medical society territory to every mother in the territory should be effective. At any rate, the mothers cannot be urged too often through any means at our disposal to seek early care and advice from their family physicians.

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE

A. S. HAMILTON, M.D.....Minneapolis
D. C. BALFOUR, M.D.....Rochester
J. T. CHRISTISON, M.D.....St. Paul
E. L. GARDNER, M.D.....Minneapolis
JOHN M. ARMSTRONG, M.D.....St. Paul
R. E. FARR, M.D.....Minneapolis

CARL B. DRAKE, M.D., St. Paul.....Editor
Lewis M. Daniel, M.D., Minneapolis.....Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna.....First District
F. M. Manson, M.D., Worthington.....Second District
Geo. B. Weiser, M.D., New Ulm.....Third District
H. B. Aitkens, M.D., LeSueur Center.....Fourth District
F. U. Davis, M.D., Faribault.....Fifth District
E. L. Gardner, M.D., Minneapolis.....Sixth District
Paul Kenyon, M.D., Wadena.....Seventh District
O. E. Locken, M.D., Crookston.....Eighth District
E. L. Tuohy, M.D., Duluth.....Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV August, 1931 No. 8

THE DRUGGIST AND THE DOCTOR

An article on the unsatisfactory relations existing between the druggists and doctors entitled "Why Don't We Get Together?" in the July number of the *Northwestern Druggist* offers some food for thought. A number of criticisms of each profession by various members of the other profession form the subject material. As Sir Roger de Coverly was wont to say, "Much may be said on both sides."

We doubt whether the relations between the two professions are as strained as the article might lead one to suppose. The work of the two professions is supplementary, with the same objective—the patient's interest. Incidentally both groups have to earn a living. Isn't it true that most of us frequently consult some acquaintance in the other profession for information regarding the compounding of prescriptions—a subject that is their specialty? We admittedly know less about pharmacy than our predecessors. The same may be said of the druggists. How many of them are expert pharmacists?

While the physician is admittedly poorly informed on the subject of pharmacy, the pharmacist must in honesty admit his limitations in therapeutics. Counter prescribing by the druggist is surely against the public good, is likely to be useless (another item in the unnecessarily high cost of sickness), and in some instances distinctly harmful. The subject must be viewed, however, with a certain amount of common sense. Certain remedies are and should be sold directly to the public by the druggist. Suggestions on the part of the druggist that the purchaser see a physician for trivial ailments would suggest collusion between the two professions. On the other hand, the medical profession which has declared it unethical for its members to prescribe remedies of unknown composition expects the druggist to step in line.

The evils of self medication will always be with us and will have to be combated by various methods. The practice forms an important item in the cost of sickness which might be prevented. Physicians have come to rely less and less on medicines, so many of which are useless. Most of us limit our prescriptions to the small list of truly efficacious remedies. Incidentally the old time shotgun prescription being a thing of the past the incompatibility of drugs has come to be a matter of minor importance.

It will always be necessary continually to emphasize the foolishness of self medication in all publicity activities. All but a few of the more enlightened newspapers are still offenders in their advertising of fake remedies and the air is full of nauseous fake health remedies. Doubtless the improvement already shown in some quarters will continue.

Substitution and the intentional incorrect filling of prescriptions is probably the most reprehensible sin on the part of the druggist. The physician is entitled to feel absolute confidence that his patient is getting what his prescription indicated.

We have frequently had a great deal of sympathy for the druggist when he is called upon to fill prescriptions following a tour of the local medical profession by a detail man. New remedies of unproven value have to be stocked for perhaps a single prescription. The druggist feels he must charge enough for the prescription to reduce as much as possible what is likely to be a losing deal.

Drugs as well as the doctor's fee are generally considered an unnecessary expense by the laity and the average individual usually is alive to a charge of a few cents more for a prescription on the part of the uptown druggist, forgetting that he is forced to charge more because of a smaller volume of business, delivery service, et cetera. We know of only one wealthy druggist and, in this instance, only by hearsay. There probably are a few. Those who make a good income doubtless make it on side lines—everything from the postage stamp to the automobile tire.

After all, the solution of these difficulties lies in both groups playing the game according to the rules. It is simple enough for either group to gather instances of infringement by individuals in the other group. Honesty on both sides is all that is necessary.

TETANUS PREVENTION

The Fourth of July is past. So far we have seen no reports of deaths from tetanus following injuries from fireworks. The story of the prevention of tetanus deaths following the idiotic celebration of our national independence day is a fine example of what can be accomplished through specific serum inoculation and publicity. In 1903 there were 406 deaths from tetanus following Fourth of July injuries. This was reduced in 1904 to ninety-one and in 1913 to four. It would be grounds for malpractice if a physician failed to administer tetanus antitoxin following a Fourth of July injury. How about injuries the remaining 364 days in the year?

Unfortunately the results of the administration of tetanus antitoxin in the comparatively few cases of infected wounds encountered by the general practitioner are not striking. He never knows whether he has prevented the development of tetanus or not. One sad experience with an infected wound, and every infected patient receives the inoculation for a time at least.

Tetanus is a strange and subtil infection and strikes when one least expects it. The idea of the rusty nail's causing the infection has been put in the discard. We know that fertilized soil is the chief habitat of the tetanus bacillus. Penetrating wounds furnish the anaërobic soil for its growth. Whether the germ on the skin is driven into the wound or whether the wadding or piece of firecracker contain the germ is not clear. The anaërobic medium in the penetrating wound is probably the important consideration.

Experience during the World War with infected wounds on a large scale demonstrated conclusively the value of prophylactic tetanus inoculation. Occasionally tetanus has developed in spite of one inoculation and therefore a second dose or even weekly doses are recommended for safety.

The case of tetanus reported in this number of the journal is one of a patient that recovered. At the same hospital this year a fatal case occurred, the fatality resulting probably from an anaphylactic reaction. Another reported in the newspaper following a firecracker burn was determined to have been due to cerebral hemorrhages, possibly due to a coexisting encephalitis.

We know of another death from tetanus that occurred in Saint Paul in July in spite of one preventive inoculation and heard of a recent similar case in Saint Cloud.

When once tetanus has developed the treatment has to be rigorous and the mortality is high. Prevention is safer and easier but requires vigilance. It is very easy to become lax in this matter. Because of a seeming increase in the incidence of the infection attention is called to the importance of its prevention, by at least two inoculations at a week's interval.

OBITUARY

Dr. J. J. O'Hara

1868-1931

The death of Dr. J. J. O'Hara, Janesville, Minnesota, president of the Waseca County Medical Society for the year 1931, occurred at his home July 6, 1931. Death was caused by coronary thrombosis. Dr. O'Hara was sixty-three years of age at the time of his demise.

Dr. O'Hara was born February 8, 1868, at Edinburgh, Scotland, the son of Mr. and Mrs. James O'Hara. He came to Canada as a young man, and entered Queens University at Kingston, Ontario, from which institution he received his degree as a physician and surgeon in 1898. The same year he came to Alma City, where he engaged in the practice of medicine until a few years later, when he moved to Janesville.

Always active in civic matters, Dr. O'Hara has served for a number of years as president of the local library board, as officer of the county Red Cross organization and as president of the county medical association. He was a member of long standing in the Masonic order, the Modern Woodmen of America and the Royal Neighbors. He is survived by his wife and two sons, Bruce A. O'Hara, of West Allis, Wis., and D. M. O'Hara of Saint Paul.

Dr. L. A. Fritsche

1862-1931

Dr. L. A. Fritsche, veteran New Ulm physician and surgeon, died at his home June 18, 1931. Death followed an illness resulting from a collapse last November which occurred while Dr. Fritsche was making one of his closing speeches in his campaign for Congressman of the Second district, as farmer-labor candidate.

Dr. Fritsche was born on a farm in Lafayette township, Nicollet county, May 28, 1862. His parents, the late Mr. and Mrs. Frederick Fritsche, were prominent pioneer settlers of that community. After spending his boyhood on the farm, and finishing the rural school, Dr. Fritsche attended St. Peter High school, before entering the medical college of the University of Michigan, at Ann Arbor.

He was graduated from the medical school in 1887, the year Minnesota's medical practitioners' licensing statute became effective. Although not required to pass the Minnesota State Board of Medical Examiners, due to the fact that he had received his degree before the law went into effect, he decided to take the prescribed examination, passed it, and received the first license to be issued by the board.

Returning to New Ulm, Dr. Fritsche practiced his profession there for one and one-half years, and then went to Germany, to take a postgraduate course at the University of Berlin, which he completed in 1890. Thereupon he came back to New Ulm, and had since practiced medicine and surgery there, being the oldest resident physician, in years of service to the community, at the time of his death. Dr. Fritsche was the first in that section to employ aseptic and antiseptic surgery, and was one of the first surgeons in Minnesota to perform an appendectomy operation.

Dr. Fritsche was a member of the State Board of Medical Examiners from 1900 until 1902.

While Dr. Fritsche's practice was very extensive, he still found time to take a keen interest in political and civic affairs. He was first elected mayor of New Ulm in 1912, and served as chief executive for ten years.

While attending Berlin university, Dr. Fritsche was a member of the 10th International Medical Congress, which convened in that city in 1890, and presented two cases in the English language to the Gynecological section for Prof. Dr. Alfred Duehrssen. He served as health officer of New Ulm from 1891 to 1894, and held many other public offices of his town and county.

Dr. Fritsche was one of the organizers of the farmer-labor political movement in New Ulm, and his counsel was eagerly sought by the leaders of that party in Minnesota. He was a candidate for governor, under the farmer-labor banner, in the primary elections of 1924 and 1928, and was candidate of his party for congress from that district last fall. In 1922 he entered the race for the farmer-labor nomination for United States senator.

In the death of Dr. Fritsche, New Ulm and the state lose one of their foremost citizens, who was loved and respected by all who knew him. A pioneer physician, before the advent of the automobile and good roads, he cheerfully responded to calls for his services, not only from patients in New Ulm and immediate vicinity, but in a large radius, regardless of weather, winter and summer. He sacrificed much for those dependent upon him for medical aid.

Another exemplary characteristic was his readiness to help the needy, and he gave liberally to every worthy cause.

Dr. Fritsche's generosity was almost a fault. No one in need came to him in vain. He gave liberally of his means, but did so unostentatiously. He also contributed generously of his time and efforts to civic enterprises, never being too busy to do even more than his share toward furthering the welfare of his community and the state.

Dr. Fritsche was married in Berlin, Germany, June 14, 1890, to Miss Amalie Pfaender, daughter of the late Colonel and Mrs. William Pfaender, Sr., his surviving widow. To this union, seven children were born, two of whom preceded their father in death, namely, Alexander Frederick, who died in infancy, and Dr. William Fritsche, who passed away in 1923. The five living sons and daughters are: Mrs. H. W. Bond, White Plains, N. Y.; Drs. Albert and Carl Fritsche, who were associated with their father in the Fritsche clinic here; Miss Louise Fritsche, who recently received her degree as master of arts from Columbia University, New York; and Dr. Theodore Fritsche, interne at Letterman Army Hospital, San Francisco, Calif. There also are three grandchildren, as well the the following brothers and sisters: Mrs. William Mueller, St. Peter, and Emil and Otto Fritsche, Lafayette township.

A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

A Doctor Talks to Social Workers

An important and much needed plea for better and closer coöperation of public health workers with the family physician was made in Minneapolis recently before the National Conference on Social Work by E. A. Meyerding, St. Paul, Secretary for the State Association.

At the moment Dr. Meyerding was speaking as the head of the Christmas Seal organization of Minnesota and his observations were not those of a representative of organized medicine but of an experienced public health worker addressing other public health workers and social service workers. The talk was therefore bound to be particularly effective—another instance, in fact, of the successful working of the unique liaison between public health agencies and organized medicine in our State.

Below are reprinted a few pertinent excerpts of the talk, which reached many conference delegates from all parts of the United States.

"Time was when we public health workers were content if one or maybe two medical men in the community interested themselves in our work. If the rest of the practicing medical profession seemed indifferent or antagonistic to the work, we took it as part of the inevitable state of things and did nothing.

"We know now that such a state of things is wholly unnecessary. We know, also, that we cannot now and never did accomplish anything of lasting worth that had not the approval and help of the family physician.

"It is well for us to remember, in the first place, in these days of long and intensive training for the practice of medicine, that we cannot hope to discover any other group engaged in health work with the knowledge and training possessed by this especially qualified class.

"Furthermore—and this is an angle of the question that needs great emphasis now and then—the lay worker must remember that the most indifferent and apparently under-qualified medical practitioner in an obscure country community is bound to know a good deal more about health in general and about his community in particular than the best informed and the most enthusiastic of lay health workers.

"Any state program such as ours, involving such projects as diphtheria inoculation or Mantoux tuberculin testing, is ended, so far as our active participation is concerned, when the few days of testing or clinics are past. If the medical men of the community have not already been persuaded of the value of the project, if their aid has not already been enlisted through the regular channels, both at the time of the clinics and after, then our own time and money and enthusiasm have been worse than wasted.

"We have found in the Minnesota Public Health Association that if our program is conservative and scientifically sound the medical men have been more than willing to accept and endorse it. As local distributor of health, the doctor has as much pride and interest in all local health movements as the lawyer or the hardware man or the grocer or the druggist or banker have in their special fields. The smaller the community the more justly the medical man may feel that he is, after all, the logical guide in these matters for his friends and neighbors.

"In any case our part as a semi-official health agency has been strictly education. The best that we can do to further the use of the Mantoux test, for instance, is to demonstrate it for the laity, for the public health official and for the doctor. We must show all of these how it works, what its benefits may be expected to be. If we fail to prove our point to the regular medical practitioner we have failed in the most important part of our program. Our work becomes a trivial fruitless business, something new to occupy field workers and annoy busy doctors—of no use at all in the fight against disease."

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M. D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of August will be as follows:

August 5—End-results of the Treatment of Overweight.

August 12—Mongolian Idiocy.

August 19—The Liver Treatment of Pernicious Anemia.

August 26—The Occupational Factor in Cancer.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Through the kindness of Headmaster Charles W. Newhall the facilities of the Shattuck School have been turned over to the members of the Southern Minnesota Medical Association and their friends, for the annual meeting, which is to be held at Faribault in the Shattuck School on August 24.

PROGRAM

MORNING SESSION

8:00 A. M.—School for Feebleminded
- Demonstration of mental cases—J. M. Murdoch, M.D., and Staff

9:00 A. M.—Shattuck School
- Pediatric clinic—E. D. Anderson, M.D., Minneapolis
- X-ray demonstration—R. G. Allison, M.D., Minneapolis, and C. G. Sutherland, M.D., Rochester
- Varicose vein clinic—R. C. Logefeil, M.D., Minneapolis
- Demonstration of psychometric tests—Fred Kuhlman, M.D., Minneapolis (Director Division of Research of the Minnesota State Board of Control)
- Dermatologic clinic—P. A. O'Leary, M.D., and Staff, Rochester

11:00 A. M.
- Pathologic demonstration—H. E. Robertson, M.D., Rochester, and A. M. Snell, M.D., Rochester
- Hematology demonstration—F. J. Heck, M.D., Rochester, and C. H. Watkins, M.D., Rochester
- Unusual case reports—Discussion led by Moses Barron, M.D., Minneapolis
- Case of a large gall stone causing intestinal obstruction—B. J. Gallagher, M.D., Waseca
- Case of streptococcic septicemia with recovery—O. J. Swenson, M.D., Waseca
- Sarcoma of the jaw in a three-weeks' old infant, and albuminuria in pregnancy—C. C. Leck, M.D., Austin.
- Others to be announced later.

AFTERNOON SESSION

2:00 P. M.
- Normal and abnormal motility syndromes of the upper urinary tract with indications for drug and sympathectomy therapy—W. P. Herbst, M.D., Minneapolis
- Selection of patients for prostatectomy—Hugh Cabot, M.D., Rochester
- The injection treatment of hemorrhoids: some fallacies and complications—Walter Fansler, M.D., Minneapolis
- Carcinoma of the bronchus—P. P. Vinson, M.D., Rochester
- Analysis of 600 cases of spinal anesthesia—W. C. Stillwell, M.D., Mankato
- Paper—S. W. Harrington, M.D., Rochester
- Treatment of pneumonia—H. A. Reimann, M.D., Minneapolis
- And others

BANQUET

6:30 P. M.—Banquet Hall, Shumway Hall, Shattuck School
- President's address—J. T. Schlesselman, M.D., Mankato
- Address of welcome—C. W. Newhall, Headmaster, Shattuck School
- Remarks—W. A. Rohlf, M.D., Waverly, Iowa, (President, Iowa State Medical Association)
- Talk on Russia illustrated by movie films—T. L. Birnberg, M.D., St. Paul Amphitheater, Shumway Hall, Shattuck School

It has been suggested that possibly many members would like to come to Faribault on Sunday afternoon. There is an excellent golf course, tennis courts, and swimming pool which may be used on Sunday afternoon and any time Monday. Luncheon will be served at the Shattuck School, as will dinner, and there is ample space for parking.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

A distinguished and varied program of scientific and social events has been arranged for the Northern Minnesota Medical Association meeting to be held at Hibbing, on Monday, September 14, 1931.

A trip into the open pit of the mine and a tea for Auxiliary members are among the events scheduled for the day.

Scientific sessions will be held at the Androy Hotel. The first will be a clinico-pathologic conference by Dr. M. M. Fischer, internist; Drs. G. L. Berdez, pathologist; Gage Clement and J. R. McNutt, roentgenologists, with discussions led by Dr. E. L. Tuohy, all of Duluth.

Dr. L. R. Gowan, Duluth, will read a paper on

"Multiple Sclerosis," and Dr. O. W. Rowe, Duluth, will talk on "Pediatrics."

Dr. D. C. Collins and Dr. John S. Lundy, Rochester, will talk respectively on "Peptic Ulcer" and "Modern Phases of Anesthesia." Dr. A. N. Snell, also of Rochester, will talk on "What the American Doctor Sees in Europe." Dr. Thomas Myers, of St. Paul, will talk on "Pathology of the Newborn" and Dr. W. H. Hengstler, also of St. Paul, on "Remote Effects of Head Injuries." Dr. N. O. Pearce, Minneapolis, will repeat the paper, with slides, on Medical Economics, which he gave at the State meeting in May.

Dr. M. S. Henderson, Rochester, President-Elect of the Minnesota State Medical Association, and a mining engineer recently returned to America from Russia, will appear on the evening program.

Dr. B. S. Adams, Hibbing, and Dr. E. K. Smith, of Duluth, are in charge of the program.

UPPER MISSISSIPPI SOCIETY

More than thirty physicians and their friends from various parts of the district attended the summer meeting of the Upper Mississippi Medical Society held at International Falls on Saturday, July 18, 1931.

An important Scientific program in the Masonic Hall at International Falls occupied the morning. A fish dinner at the Rainy Lake Hotel at Fort Frances, Ontario, and a delightful four hour boat excursion on Rainy Lake, with stops at some of the fine Rainy Lake summer estates, were on the day's schedule.

An intense interest on the part of everybody present in the affairs of the society and organized medicine in general and in the papers presented was an outstanding feature of the meeting. On the program were:

Dr. E. A. Meyerding, St. Paul, "What's Doing in Your State Medical Society"; Dr. P. F. Eckman, Duluth, "Secondary Anemias"; Dr. Donald Creevy, Minneapolis, "Prostatic Obstruction"; Dr. Karl Anderson, Minneapolis, "Treatment of Nephritis"; Dr. L. R. Gowan, Duluth, "Localization of Spinal Cord Tumors"; Dr. W. W. Lewis, St. Paul, "Inflammatory Infection of the Middle Ear"; Dr. Paul G. Bohman, Duluth, "Newer Methods of Diagnosis in Diseases of the Lung."

Many of those who attended remained in the North for several days to finish their vacations.

WABASHA COUNTY SOCIETY

The sixty-third annual meeting of the Wabasha County Medical Society was held at Lake City, Minnesota, Thursday, July 9, 1931.

The scientific program was carried out as published in the July number of MINNESOTA MEDICINE.

The following officers were elected to serve for the coming year: President, Dr. W. F. Wilson, Lake City; vice president, Dr. W. B. Stryker, Plainview; secretary-treasurer, Dr. Russell H. Frost, Wabasha; delegate to State Association, Dr. H. E. Bowers, Lake City; alternate, Dr. D. P. Dempsey, Kellogg; censor for three years, Dr. W. J. Cochrane, Lake City. The other censors are Dr. J. F. Bond, Wabasha, and Dr. J. A. Slocum, Plainview.

It was voted to hold the next annual meeting at Plainview. Dinner was served at the Hotel Lyon through the courtesy of the Lake City members of the Society was present to discuss with a similar committee twelve members and affiliates, four visiting physicians, two laymen, and the ladies accompanying.

Following the dinner and picture feature captivatingly presented by Dr. Thomas S. Roberts of the University, the ladies were given a boat ride on Lake Pepin.

A committee from the Winona County Medical Society was present to discuss with a similar committee from the Wabasha County Society the advisability of amalgamation of the two societies.

A resolution was drawn up favoring such merger, and is to be submitted to each member of the two societies for vote.

Following the address of Dr. E. C. Bayley, which stressed the necessity of pure milk as a preventive of several diseases, action was taken toward securing pasteurized milk for all places in the county not already afforded such supply.

In line with the present teaching regarding humidity as a health factor in winter heating, a newly devised and comparatively inexpensive humidifier was demonstrated to those in atendance.

The usual vote of thanks was tendered all those who had a part in the entertainment of the society.

W. F. WILSON, *Secretary.*

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. S. S. Hesselgrave, St. Paul
Chairman Press and Publicity—Mrs. E. A. Meyerding, St. Paul
Editor—Mrs. A. A. Passer, Olivia

Two Minnesota women were elected to national offices in the Women's Auxiliary of the American Medical Association at the meeting in Philadelphia, which was held from June 8 to June 12: Mrs. James Blake, Hopkins, Vice-President; and Mrs. Sherman S. Hesselgrave, Saint Paul, Recording Secretary.

LYON-LINCOLN COUNTY AUXILIARY

Mrs. S. S. Hesselgrave, St. Paul, recently elected recording secretary of the Women's Auxiliary to the American Medical Association and former president of the Women's Auxiliary to the Minnesota State Medical Association, assisted in the organization of the Lyon-Lincoln County Medical Society Auxiliary at Marshall, Minnesota, on June 29, 1931.

The occasion was a joint dinner between medical society members and the new women's group. Following the dinner the two groups held separate meetings. Mrs. Hesselgrave was introduced to the women's meeting by Dr. W. G. Workman, Tracy, Minnesota. Dr. E. A. Meyerding, St. Paul, Secretary of the State

Association, also talked to the women on "The Uses of the Auxiliary."

The following officers of the new organization were elected: Mrs. W. W. Yaeger, Ivanhoe, President; Mrs. Peter Hermanson, Hendricks, Vice-President; Mrs. W. G. Workman, Tracy, Secretary, and Mrs. W. H. Valentine, Tracy, Treasurer.

NEW AND NON-OFFICIAL REMEDIES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

Syrup No. 112 Ephedrine Hydrochloride.—It contains ephedrine hydrochloride-Lilly (New and Non-official Remedies, 1931, p. 175), 0.22 Gm., in 100 c.c. (1 grain per fluidounce), and alcohol, 12 per cent. Eli Lilly & Co., Indianapolis, Ind.

Quiniobine.—Quinine bismuth iodide rendered soluble in olive oil by means of lecithin. Each c.c. contains 0.03 Gm. of bismuth, 0.03 Gm. of quinine, 0.075 Gm. of iodine, and 0.22 Gm. of lecithin. Quiniobine is proposed as a means of obtaining the systemic effects of bismuth in the treatment of syphilis (New and Non-official Remedies, 1931, p. 94). It is claimed that, since in Quiniobine the quinine bismuth iodide is soluble, the injections are usually only slightly painful and the dosage is more accurate than with suspensions of quinine bismuth iodide. It is supplied also in the form of 2 c.c. ampules. Spicer & Co., Glendale, Calif. (Jour. A. M. A., June 6, 1931, p. 1953.)

Calcium Gluconate.—It contains calcium equivalent to not less than 12.4 nor more than 12.8 per cent of calcium oxide. Calcium gluconate is used to obtain the therapeutic effects of calcium. It is more palatable than calcium chloride for oral administration and for hypodermic or intramuscular use is non-irritant.

Calcium Gluconate-Pfizer.—A brand of calcium gluconate-N.N.R. Chas. Pfizer & Co., Inc., Brooklyn, N. Y.

Concentrated Pollen Antigens-Lederle.—Liquids obtained by extracting the protein from the pollen of plants with a liquid consisting of 67 per cent of glycerin and 33 per cent of a buffered saline solution. For a discussion of the actions and uses, see Allergic Protein Preparations, New and Non-official Remedies, 1931, p. 23. Concentrated pollen antigens-Lederle are marketed in packages of fifteen syringes containing increasing dosages; also in supplementary treatment packages of five syringes. The following product has been accepted: Concentrated Pollen Antigen (Lederle) Ragweed Combined (Common and Giant Ragweed in equal parts). Lederle Laboratories, Inc., Pearl River, N. Y. (Jour. A. M. A., June 13, 1931, p. 2036.)

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

SMACO (206) Powdered Whole Milk (S. M. A. Corporation, Cleveland).—A powdered spray-dried whole milk hermetically sealed in tins in an atmosphere of nitrogen. It is claimed by the manufacturer that each 12 ounce can will make 2.8 quarts of liquid milk of normal strength.

Firch's Ma Made Bread (Sliced and Unsliced) (Firch Baking Company, Inc., Erie, Pa.).—A white bread (sliced and unsliced) made by the sponge dough method. (Jour. A. M. A., June 6, 1931, p. 1953.)

Torex (Concentrated Beef Bouillon) (International Products Corporation, New York City).—A semifluid mixture of beef extract, salt, vegetable extract, starch and powdered white pepper and onion; packed in block-tin tubes. It is claimed that this product dissolves instantly in hot water, that it permits the quick preparation of a warm drink for the home and camp table and that it is adapted for seasoning gravies, stews, etc.

Bowey's Hot Chocolate Powder (Bowey's Inc., Chicago).—A mixture in powdered form of chocolate liquor, cane sugar and skim milk flavored with vanilla extract. It is claimed that this product makes a wholesome and delicious beverage of high caloric value which can be used in the preparation of delicious desserts.

Libby's Sterilized Unsweetened Evaporated Milk (Libby, McNeil and Libby, Chicago).—An unsweetened evaporated milk. It is claimed that this product approximates ordinary milk when diluted with an equal volume of water. It is proposed for use in infant feeding and may be used in cooking and baking as is ordinary milk. (Jour. A. M. A., June 13, 1931, p. 2037.)

Merrell-Soule Powdered Protein Milk (Merrell-Soule Co., Inc., New York City).—A powdered food made from milk; higher in protein and lactic acid and lower in lactose than dry whole milk. It is claimed that when restored to liquid form with water it closely approximates Finkelstein's protein milk formula. It is said to be indicated in cases of dyspepsia, alimentary intoxication, marasmus and celiac diseases.

Mead's Powdered Lactic Acid Milk Noncurdling No. 2 Plain (Mead Johnson & Co., Evansville, Ind.).—A powdered, spray-dried homogenized milk containing added lactic acid. It is claimed that the powder may be readily mixed with cool or hot water to form a fine suspension. The mixture may be boiled without curdling or change of color or taste. It is recommended for infant feeding.

Paul's Redi-Sliced Bread (Paul's Baking Corporation, Chicago).—A white bread made by the sponge dough method, in sliced loaf form. It is claimed to be a bread of good quality. (Jour. A. M. A., June 20, 1931, p. 2104.)

Saylor's Hom-Aid Bread (Saylor's Bakery, Inc., Tamaqua Heights, Tamaqua, Pa.).—A white bread made by the sponge dough method. It is claimed to be a bread of good quality.

Kwality Twin Loaf Bread (Kwality Baking Company, Champaign, Ill.).—A white twin-loaf bread made by the sponge dough method. It is claimed to be a bread of good quality. (Jour. A. M. A., June 27, 1931, p. 2197.)

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—A young man, 23 years of age, college graduate, teaches school in winter and works on a farm in summertime. He recently had a complete examination at a clinic and a diagnosis of recurrent hemorrhages of the right eye into the vitreous with retinitis proliferans was made; the cause probably being tuberculosis. General examination, including an X-ray of the chest, is essentially negative. Had a very markedly positive tuberculin reaction but appears to be in excellent physical condition.

Vision is normal in both eyes. The right fundus examination shows fine floating opacities in the vitreous. The nasal half of the disc is obscured by a thin vascularized membrane of connective tissue extending two or three disc diameters above and below the disc and also into the vitreous. There are two small linear hemorrhages and a small area of proliferation about the periphery of the fundus. The fundus examination of the left eye is negative.

1. Is it probable that this condition will go on to blindness, and are there any definite measures that might prevent blindness?

2. In addition to hygienic measures tending to build up natural resistance, including ultraviolet irradiation, high vitamin diet and cod liver oil, is the gradually increasing dosage of old tuberculin considered good treatment? Should the patient derive immediate benefit from the same, or must it be continued over a period of several years?

3. In the matter of this man doing farm work in the summer, should any restrictions be placed on strenuous or severe work? Is it likely that hard work might increase the hemorrhages into the eye?

4. Are there any other therapeutic measures that might be used, such as the non-specific foreign protein injections?

Answer.—1. The tendency is for this condition to recur, with progressive loss of vision. It is probable that eventually the entire sight of the affected eye will be lost.

2. Systemic measures are very important, and you have outlined very well those which should be included in the treatment. Old tuberculin is not recommended, although used by some ophthalmologists. The tendency for reaction to occur is too great and those who use it are probably in the minority. It is not recommended for your patient.

3. Farm work, especially the more strenuous part, is not indicated. He should be advised to try some other summer occupation.

4. Boiled milk injections should be given. Inject from 10 to 15 c.c. of boiled milk, intramuscularly. Before you do this, take the leukocyte count and follow it at definite intervals, say every two days thereafter. When the count returns to normal, give a second injection. Three or four such injections should be given, followed by a rest for a month or so and then the treatment continued. In any event, the prognosis for complete preservation of vision is not good.

2. *Question.* Carpenter, 65 years, consulted me not long ago because of pains in various parts of the body and regurgitation of mucus in the morning. He has been ill for about a year. The pains are located chiefly in the muscles of the extremities and in the bones of the lower back region. They come and go, but are severe enough to keep him awake at night. He never vomits food, but brings up slime. When this material is out of the way, he is able to eat. Appetite is poor and he is constipated. There has been apparent marked weight loss in the past year. About three months ago he had a spell which was called a "stroke" by his physician. At that time his speech became indistinct and his tongue protruded to one side. No other paralysis noted. Speech difficulty partially improved. Slight unproductive cough and generalized chest pain for the past year. For several years he has had difficulty in urination. The stream became slower and nocturia developed. Physical examination is as follows: Blood pressure 130/70. Pulse 92. Temperature 97.8. The appearance is cachectic, tongue protrudes definitely to right side. No chest râles. There is definite widening of the upper sternal dullness, loud booming first tone at apex. No abdominal masses. Definite tenderness to percussion over sacrum. Rectal examination shows prostate to be only moderately enlarged, but there are a few small, hard nodules present, especially in the mid-portion. The knee and ankle reflexes are absent on the left. The upper extremity reflexes are present and qual. Hemoglobin 76 per cent, leukocyte count 11,600. Urine negative. Gastrointestinal X-ray study negative. X-ray of the chest, skull, pelvis and lumbar spine show hazy, punched-out areas in the bone and new bone formation. There are, also, definite soft shadows in the lungs. May we have your opinion in this case?

Answer.—The lesions in the lungs and bones are metastatic tumor deposits, and are both of the osteoclastic and osteoblastic types. From the X-ray standpoint alone, the diagnosis is metastatic carcinoma, probably from a tumor in the prostate gland. Multiple myeloma must also be considered, but the chest findings are against this diagnosis. Other metastatic tumors may show a similar picture, *e.g.,* a silent hypernephroma cannot be ruled out. From your description of the condition of the prostate it is most likely the source of metastasis. If the pain is severe, deep X-ray treatment is very helpful. While it may not influence the course of the disease it does make the patient feel better. Unless signs of urinary obstruction develop, no prostatic treatment is indicated. If obstruction takes place, a cystotomy can be done. Carcinoma of the prostate frequently acts like your description of this patient. The outlook is unfavorable, but the disease may progress rather slowly. The question of metastatic brain tumor as a cause of the stroke should also be considered. If the lesions in the brain are multiple tumor deposits, a diffuse reaction, chiefly inflammatory, resembling encephalitis, may be observed. The possibility of this development is strengthened by a personality change. It is most probable that the brain lesion is an accident and unrelated to the malignant condition.

OF GENERAL INTEREST

Dr. Arthur R. Kintner has moved from Rochester, Minnesota, where he was associated with the Mayo Clinic, to 1004 Central Avenue, Nebraska City, Nebraska.

Dr. and Mrs. Myron O. Henry have returned from Europe, where Dr. Henry spent three and one-half months in various clinics. He attended the meeting of the German Surgical Society in Berlin, the French Orthopedic Society at Berck-Plage, and also the British Orthopedic Society at Aberdeen, Scotland.

Dr. William Harold Ford, who is a graduate of the University of Minnesota, class of 1931, and who completed his Interneship at Ancker Hospital, Saint Paul, July 1st, has opened an office at 5161 Bloomington Avenue South, Minneapolis, for the general practice of medicine and surgery.

Members of the Association are urgently requested o look among their old papers and into the local medcal archives for the transactions of the Minnesota State Medical Association of the years 1865, 1887 and 1888. These papers are missing from the otherwise complete documentary history of the Association, and the state office will be greatly obliged to anyone who can supply hem.

Dr. and Mrs. C. J. Plonske of Faribault recently reurned from an extended tour by auto through the outheastern and eastern states, returning by way of Montreal. Attendance at the American Medical Assoiation meeting in Philadelphia was included in the trip. Dr. and Mrs. Plonske were accompanied by their daugher, Marion, and by Mrs. Plonske's father, Mr. F. H. Clarke of Minneapolis.

Dr. F. S. Warren, who discontinued practice in Fariault last fall, upon the occasion of a visit to Faribault n June with his wife and daughter, tendered a dinner o the physicians and nurses of the city. Dr. Warren ave an interesting account of his recent automobile trip o Florida, and numerous humorous and interesting peeches by those in attendance rendered the occasion most enjoyable. Dr. Warren left early in July for a our of the West.

Among summer epidemics of interest to the doctor in Minnesota this year, is an unusual outbreak of malractice suits.

The most effective protection against this epidemic s malpractice insurance carried by every member of he Minnesota State Medical Association. Such insurance may be obtained in the Aetna through our group policy as well as in several other good companies.

By all means, see that your malpractice policy has not lapsed. Remember also that what you say about your fellow practitioner may well start a malpractice suit.

Twenty-one out of 42 reports from probate judges in Minnesota counties indicate that officials are wholly in favor of organized medicine and eager to coöperate with its membership.

This desirable state of things is revealed in the interesting reports that are coming in to the state office these days following the bestowal through members in the county seats of the 1931 rosters of the association upon all county judges of probate in the state.

Of the other 21 reported, only four seemed to the members concerned to be definitely indifferent or uninterested in the state association and organized medicine in general.

Many enthusiastic statements were quoted from the 21 friendly judges by reporting members.

"Thank you. That is fine! said the Judge," reports the Stillwater member. "He thinks an M.D. not belonging to a county society is like a lawyer not belonging to the bar association and NO GOOD."

Other emphaticallly friendly officials were discovered in Detroit Lakes, St. James, Windom, Owatonna, Crookston, Little Falls, St. Cloud, Chaska, Wheaton, Ortonville, Glencoe, Cambridge, New Ulm, Marshall, Two Harbors and Worthington.

Several judges in the various counties were not approached at all, mainly for the reason that, all of the physicians in the county being members of the association, the members felt sufficiently assured of official cooperation anyway.

Two judges were reported in their dotage as a sufficient reason for lack of active interest in the matter. Another was rather astonishingly quoted as surprised to know that there was such a thing as a medical organization. Such a thing as expressing himself adverse to organized medicine was beyond the scope of his comprehension.

The following, who have been serving as internes at the Ancker Hospital, Saint Paul, the past year, are listed with their present positions and locations:

Dr. William R. Yeager is in general practice at Parkersburg, W. Va.

Dr. Waldemar G. Johanson is resident on the Receiving and Medical services at Ancker Hospital.

Drs. John P. Burgess, Viktor O. Wilson, and Alfred G. Ouellette are residents at the Children's Memorial Hospital, Chicago, Ill.

Dr. Harvey J. Brekke is resident at St. Luke's Hospital, Saint Paul.

Dr. W. Harold Ford is in general practice at 5155 Bloomington Ave. So., Minneapolis.

Dr. Thomas A. Starkey is a Fellow in medicine at the Mayo Clinic, Rochester.

Dr. Morris Greenberg is in general practice in Saint Paul.

Dr. William H. Lamberson is doing post-graduate work in otolaryngology at the University of Pennsylvania, Philadelphia.

Dr. J. Marshall Neely is resident pathologist at the Ancker Hospital, Saint Paul.

Dr. Harold L. Bolender is resident at the Midway Hospital, Saint Paul.

Dr. Richard S. Rodgers is a resident in Medicine at the Minneapolis General Hospital.

Dr. O. Harold Muus is associated with the Engstad Clinic, Grand Forks, N. D.

Dr. Willis M. Duryea is resident in pediatrics at the Abbott Hospital, Minneapolis.

Dr. Charles H. Slocumb is a Fellow in medicine at the Mayo Clinic.

Dr. Roy L. Robertson is in general practice at Mill Valley, California, with Dr. George Landrock.

Dr. William L. Pratt is resident on the receiving and medical services at Ancker Hospital.

Dr. George L. Shivers is doing post-graduate work at the University of Minnesota and the Mayo Clinic.

Dr. Cecil A. Warren, who has been the resident on the surgical service at the Ancker Hospital, is now in general practice at 373 New Lowry Medical Arts Bldg., Saint Paul.

Dr. J. Chester Ogden is now resident at Bethesda Hospital, St. Paul.

Dr. Arthur L. Osborn, who has been resident urologist at Ancker Hospital, is specializing in genito-urinary diseases in Kansas City, Mo.

Dr. Merle O. Thoreson, who has been resident on the medicine-receiving service at Ancker Hospital, is now resident in surgery at the same hospital.

Dr. C. Henning Mattson, who has been resident on the medicine-receiving service at Ancker Hospital, is now affiliated in general practice with Dr. Olof I. Sohlberg, 564 Lowry Medical Arts Bldg., Saint Paul.

STATEMENT REGARDING THE DISCOVERY OF THE DEAFENED PRE-SCHOOL CHILD ISSUED BY THE HEALTH COUNCIL OF MINNEAPOLIS

Population centers in which work is being done for the discovery of deafened pre-school children have been notably fruitful of results. We feel sure that in this respect Minneapolis is not an exception to the general rule. Many such children are discoverable and oftentimes remediable.

We have found, and we have been repeatedly admonished by other observers, that it takes *positive* inquiry to bring out the facts of such deafening in many cases; that parents are often careless themselves in noting the loss of hearing in their young children; and that if they do discover such loss they are frequently inclined to conceal the fact of the existence of such a handicap.

They are apt to think, too, that nothing can be done about it, when as a matter of fact very much can be done in these early years, when body and mind are still in the making; when the consequences of the diseases which cause deafening are most readily overcome by the otologist; when hearing and voice can be most readily trained; when lip-reading can be very easily taught to the young child and even by the interested mother.

We have already invited your coöperation in a joint effort being made by The Health Council, the Minneapolis League for the Hard of Hearing, and the Health and Social Agencies of the City, to find and to help these deafened little ones who, left alone, will, in a very large majority of cases, grow worse and will lay the foundation in childhood years for the development of adult deafness in days to come.

Will you not give us welcome further aid in this discovery, by teaching your health and relief workers the technic of search in the home, the family, the day and the nursery schools and the kindergarten? Will you not promptly advise the Executive Secretary of the Minneapolis League for the Hard of Hearing, in the Plaza Hotel, of your findings? She will do the rest, with the help of her co-workers, and the otologists, lip-readers and voice culturists. The results will be the relief of the young deafened children of today; the carrying-forward of the retarded children of the present and of the future; the saving of hearing impairment and its limitations among the adults of the near future.

Physicians, public health nurses, and teachers are also invited to aid by the reference of any such deafened children of pre-school age, who may be guided to the care of the otologist, and to the lip-reading teacher, and to the voice-trainer.

THE EDITOR'S SONG

If you have a tale to tell,
  Boil it down!
Write it out and write it well,
Being careful how you spell;
Send the kernel, keep the shell;
  Boil it down! Boil it down!

Then, when all the job is done,
  Boil it down!
If you want to share our fun,
Know just how a paper's run,
Day by day from sun to sun,
  Boil it down! Boil it down!

When there's not a word to spare
  Boil it down! Boil it down!
Heave a sigh and lift a prayer,
Stamp your foot and tear your hair,
Then begin again with care—
  Boil it down! Boil it down!

When, all done, you send it in,
  We'll boil it down.
Where you end there we begin;
This is our besetting sin;
With a scowl or with a grin,
  We'll boil it down; boil it down.

—*The Presbyterian Advance.*

ROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of May 13, 1931

The regular monthly meeting of the Minnesota ademy of Medicine was held at the Town and untry Club, Saint Paul, on Wednesday evening, ıy 13, 1931. Dinner preceded the meeting, which s called to order by the President, Dr. J. S. Gilfil- , at 8 P. M.

There were forty-eight members and four guests sent.

Minutes of the April meeting were read and ap- ved.

Dr. H. L. Ulrich read the Necrology Committee's morial to Dr. Theodor Bratrud.

THEODOR BRATRUD, born in 1873, raised and educated Minnesota, a son of the "Giants in the Earth," car- d on the Viking spirit. Into the wheat fields of rthern Minnesota he brought the knowledge of the ert, the kindness of the great, the humility and un- standing of the prairies. His clinic was a haven of nfort and salvation to the afflicted of three states. eodor Bratrud in his diverse parts might have been prototype of the doctor in Sinclair Lewis' "Main eet"; in Ian Maclaren's "Beside the Bonnie Briar sh"; in Joseph Collins' "The Doctor Looks at Lit- ture." In his passing, one of the intrepid spirits of s state has unfurled his banner in its legendary halls. poet describes him in these lines:

"A simple man, yet none in all the land
More great. For he was ever found apart
Where beds of human suffering grimly stand;
And there, with soul alert, he lived his art—
The tender gift of healing in his hand
And God's sweet law of service in his heart."

We, the members of the Academy of Medicine, con- res of Theodor Bratrud, thus pay tribute to his mory.

We further move that a copy of this be spread on minutes of the Society and a copy be sent to his ter, Miss Luela Bratrud of Thief River Falls, Min- ota.

(Signed) F. E. BURCH,
A. SCHWYZER,
H. L. ULRICH, *Chairman.*

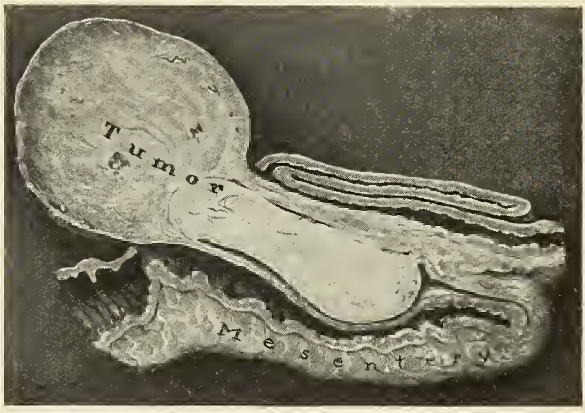
The scientific meeting was as follows:

DR. A. W. IDE (St. Paul) reported the following e:

The patient, a married woman 41 years old, was first n April 27, 1931, on account of acute abdominal dis- ess. This patient had had six children who are all liv- and well. She had had no previous illnesses; nei- r had she had any injuries. Four years ago she had abdominal operation elsewhere. The uterus was noved supravaginally on account of uterine bleed- . Her recovery from this operation was uneventful. Five weeks ago the present trouble began. There s abdominal distress with some tendency to nausea. There was obstinate constipation which gradually became worse. There was not a complete obstruction but the amount of stool passed was small and there was some blood.

When we first saw the patient she was having rather acute abdominal pain, evidently due to obstruction of the bowel. The exact nature of the obstruction could not be determined, but in view of her previous abdominal operation it was thought possible that the obstruction was due to adhesions resulting from this operation. The obstruction was evidently of the chronic type but apparently it was becoming complete.

On April 29, two days after the patient was first seen, an abdominal operation was done. Under ethylene anesthetic the peritoneal cavity was opened through the old scar. In doing so a loop of markedly distended bowel protruded through the wound. Intraperitoneal examination revealed a mass in the ascending colon which had the feel of a circumscribed tumor. Further examination revealed that there was an intussusception of the ileum into the large bowel. The loop inside of the bowel was hard and felt like a neoplasm of some kind. A considerable portion of the ileum was reduced but one loop could not be freed. A resection of fourteen inches of small bowel, including the mass, was done. About four inches of the ileum proximal to the ileocecal valve was left. This was turned in as a blind stump and a side-to-side anastomosis was made between the ileum proximal to the tumor and the cecum.



Artist's drawing of specimen removed at operation. Note intussusception of small bowel with tumor. The growth bulged completely through the bowel wall during the operation.

The patient made an uneventful recovery from the operation except for a mild wound infection. Now, fourteen days after her operation, she is sitting up and will be able to leave the hospital in a few days.

Intussusception in the adult is somewhat rare. In a monograph based on 400 cases collected from the London City Hospital by Perrin and Lindsay, the following figures are given: approximately 70 per cent of these intussusceptions occurred during the first twelve months of life; 10 per cent during the second twelve months. In other words, 80 per cent of the cases of intussusception occur during the first two years of life, 15 per cent occur between the ages of two years and fourteen years, and 5 per cent occur after fourteen years.

Elliott and Corscaden analyzed 300 cases of intussusception in adults. They observe that 100 of these cases, or 33⅓ per cent, were due to tumors of the bowel. Out of this 100 cases, 40 of these tumors were malignant and 60 were benign. You will observe from the specimen that this intussusception was due to a tumor.

Microscopic section of this tumor shows the surface to be covered by a thin layer of epithelium, evidently a remnant of the mucous membrane. An occasional mucous gland is seen near the surface. The rest of the tumor consists of spindle-shaped cells with an abundant mucinous intercellular substance. The diagnosis is myxoma. There are no mitotic figures and no areas of rapid growth, so the histological interpretation is *benign myxoma*.

Tumors of this type do not recur when completely excised. However, they have a notable tendency to local infiltration.

Dr. A. E. Benjamin (Minneapolis) reported the following case:

I wish to present a report of a case of unusually large encysted bladder calculi with enlarged prostate, hemorrhages and loss of weight.

The patient is a widower, retired farmer, 71 years of age, 5 feet 4¾ inches tall, and weighs 106 pounds. He has had very good health, with the exception of three attacks of pneumonia and rheumatism. He has had no injuries or operations. His family history is essentially negative.

About two years ago he began having pain through the bladder region, with dysuria, some frequency, and at times passed a good deal of blood, specially upon exertion. He had considerable gastrointestinal symptoms with extreme constipation, loss of appetite and weight, and he also complained of backache. Eight weeks ago he began having severe attacks of pain, with vomiting and difficulty in emptying the bladder. A diagnosis of cancer had been made.

The throat and tonsils were red, tongue slightly coated. His heart was dropped somewhat but there was no irregularity. The lungs were negative. He had a full lower abdomen with prolapse of the stomach and intestines, and a weak left inguinal ring. The prostate was considerably enlarged; he had a few hemorrhoids and moderate varicose veins of the legs. His blood pressure was 166/76, temperature 98.6°, pulse 80, respirations 20. He habitually had from 500 to 800 c.c. residual urine which contained a slight trace of albumin.

X-ray films of the pelvis and sound revealed two large stones in the bladder.

An operation was performed under spinal anesthesia. There was one stone 2¼″ × 1¾″ × 1¾″ encysted back of the prostate and difficult to dislodge. The smaller stone 1¾″ × 1¼″ × 1¼″ was lying over it. The bladder was closed without drainage, and a retention catheter inserted.

His progress has been very satisfactory since th operation; there has been no leakage of urine throug the incision. The patient was able to void after th third day when the catheter was removed. There ha been no residual urine since the operation, his temperature is normal, and he has had no vomiting. H was out of bed on the fifth day.

The conclusions and interesting factors about thi case are: the unusual size of the stones, one ston being almost completely encysted back of the prostate, the pronounced symptoms of gastrointestinal disturbance, the loss of blood and loss of weight, an the supposition by friends and a physician that a cancerous growth existed. The decision not to remov the prostate, although considerably enlarged, wa reached as the residual urine and size of the prostat was thought probably due to the presence of the stone The rapidity of progress after the operation, the lac of residual urine and the disappearance of all symptoms a few days after the operation were gratifyin

---

Dr. Francis F. Callahan (Pokegama) read hi thesis, entitled "Collapse Therapy in Pulmonary Tuberculosis," and showed slides of X-ray films of a numbe of cases.

DISCUSSIONS

Dr. D. G. Gardiner (St. Paul) (by invitation): have enjoyed Dr. Callahan's paper very much. Mos of the phrenic nerve resections you have seen on th screen have been rather recent—in the last 3 or years. Some of them speak for themselves. Lookin at the slides in these cases is like looking at autopsie —one sees some of his good and bad results.

One thing Dr. Callahan mentioned in his paper bu I do not think stressed sufficiently is the meticulou postoperative care necessary over such a long perio of time. This consists in the application of very tig adhesive strapping to the whole affected side and renewing them, each time tighter, every few days. Thi can be augmented by sand or shot bags over the lesio to aid in compression. The good results one gets fo lowing thoracoplasty are attributable to the clinicia who takes charge of the patient after operation. I als speak for Dr. Daugherty in this connection in his wor at Ancker Hospital and Pokegama Sanatorium. A fe years ago I remember seeing a patient who was operated for lung abscess. A classical two-stage thoracoplasty had been done by a general surgeon who wa not familiar with the necessity for such postoperativ care and except for the scar on his back one coul hardly tell which side had been operated. His X-ra picture showed complete regeneration of ribs follow ing thoracoplasty with full return of symptoms. Th lesson to be drawn from these is that convalescenc following thoracoplasty takes a period of months an tedious care.

I think many of the good results that any one ge after phrenic nerve evulsion should be credited to th clinician or the man in the sanatorium who gives th same care postoperatively to the patient that he do

-operatively. The selection of these cases is a very
icult problem and the clinician sometimes picks
es which even with his very best judgment are not
able for thoracoplasty but could tolerate a phren-
tomy and a long period of observation thereafter
ause phrenicectomy is in itself a simple operation
h very little possibility of doing harm attached to
I have had about 150 phrenic nerve evulsions and
e not seen any complications from them. Many
es they are only a test as to whether or not the
ient can stand thoracoplasty, and in many instances
y are sufficient to alleviate the symptoms, which
lly amounts to a cure.

r. Callahan mentioned the indications for thoracic
apse and for phrenic nerve evulsion, but of course
ideal type of phrenic nerve evulsion is the case
h the basic lesion. Unfortunately tuberculosis does
always strike the base; it usually is an upper lobe
on. In our cases at Ancker Hospital there have
n 6 cases of upper lobe lesion which have closed
owing phrenicectomy but as yet we have not seen
uitably proven case of basal tuberculosis.

think Dr. Callahan's review of the literature of
subject has been quite complete and think it speaks
l for his conservative management and attention
has paid to the cases coming under his care and
owing the cases for a long time postoperatively,
ch I think is an important point.

R. H. Longstreet Taylor (St. Paul): It seems
dly fair to go away from a subject as recent as
without going back to see how it has gradually
lved from the dark days of the 70's. In my own
erience I can recall when we had no tubercle bacilli
ook for, or at least we did not know we had them;
had no tuberculin to test with, no X-ray, and no
apse therapy. It is not so far back now since the
lsion of the phrenic nerve and thoracoplasty have
e into use. In the olden times when families were
ticular about their insurance standing, the death
ificates were nearly always "chronic bronchitis."
t lasted until the examinations for tubercle bacilli
e in.

rudeau, in his Life, says that he picked Baldwin out
a scientist because he came to him saying that he
tuberculosis of the lungs. Trudeau asked him how
knew he had tuberculosis, and Baldwin replied,
cause I have demonstrated tubercle bacilli in my
tum." Trudeau took him in and put him at the
d of the research department at Saranac Lake, where
still is. Few men would be called scientists today
ause they knew how to stain tubercle bacilli.

t is certainly very interesting to think of the
nges which the last 50 years have brought in the
tment of tuberculosis and the increased possibilities
recovery that are offered to the patient by the ar-
mentarium we have at the present time with which
handle this very serious disease.

R. H. E. Michelson (Minneapolis) read a paper on
udies on the Lymphatic Glands in Early Syphilis."
les of pathological studies were shown.

ABSTRACT

Dr. Michelson reported on his studies over the past two years on the superficial lymphatics in early syphilis; and his conclusions were as follows:

1. One hundred and forty-five lymph nodes excised from patients with untreated syphilis were examined.
2. In approximately 27 per cent of the specimens, tuberculoid structure was present.
3. The test with tuberculin, performed on 14 patients whose glands showed tuberculoid structure, was positive seven times.
4. The luotest was negative when performed on 9 patients whose glands showed tuberculoid structure.
5. Tuberculoid reactions found in the lymphatics in early syphilis are variable in type, and apparently the state of allergy is not the same as when this reaction is found in the skin.
6. True gammas of the lymph nodes differ from the tuberculoid structure found in the nodes in early syphilis.

DISCUSSION

Dr. J. F. Noble (St. Paul) (by invitation): Those of us who are interested in general pathology are particularly grateful to Dr. Michelson for this and similar histologic studies which he has carried out on dermatologic problems. The general pathologist is lost when it comes to the diagnosis of skin diseases. These lesions, to him, are simple acute or chronic inflammatory processes and it requires special study such as Dr. Michelson has given the subject to be able to recognize the finer diagnostic changes.

The microscopic pictures which Dr. Michelson has shown this evening, are, as far as I can determine, indistinguishable from tuberculosis. Tuberculosis of the lymph nodes shows two types of histologic reaction, the caseating lesion and the proliferative tuberculous lymphadenitis. The gummatous lesions are not likely to be mistaken for tuberculosis.

With reference to the question of allergy, I think Dr. Michelson is correct in concluding that this type of inflammatory reaction is not characteristic of the allergic state. Rich, Clawson and others have definitely shown that allergic inflammation may vary in degree from a slight proliferative reaction to abscess formation.

Dr. Michelson's work also brings up the question of the function of the lymph nodes in this type of infection. His work seems to show that the lymph nodes attempt to localize the infection but clinical and experimental data point to the fact that the spirochete promptly passes lymph node filter and the infection becomes generalized.

Dr. C. B. Wright (Minneapolis): For my own information, I would like to ask Dr. Michelson how he excludes the possibility of tuberculosis in these cases. Tuberculosis is a very common disease and many of these cases may have tuberculosis in addition. How do you prove that this is not a tuberculous lesion?

Dr. E. M. Hammes (St. Paul): I would like to ask Dr. Michelson if these 28 per cent of cases of early syphilis showing this reaction are more or less prone to develop central nervous syphilis later on in life.

Dr. Michelson (in closing) said he would like to emphasize what Dr. Noble said about the action of the lymphatic glands. It was previously thought that these nodes acted as barriers, but the work of many investigators in experimental syphilis had shown that the adenitis was part of the general reaction to the infection and that spirochetes could be found in the blood stream and even in the spinal fluid before there was any demonstrable lymphadenitis.

In answer to Dr. Wright's question, the cases had all been passed upon by Dr. S. E. Sweitzer, and there was no question that clinical syphilis was present. Another strong point against tuberculosis was that when a patient had a bilateral adenitis which was clinically syphilis and a gland was removed from one side, and under anti-syphilitic treatment the adenitis subsided, it was a fair presumption that tuberculosis was not present, because colliquative tuberculosis occurring in lymphatic tissue is notoriously slow to respond to any treatment, and heals only after complete elimination of the focus. Stains for tubercle bacilli had been made and were always negative. Dr. Bell also emphasized the point that liquefaction had not been found in any of these specimens.

The question that Dr. Hammes asked is the very one we have put to ourselves: What significance has this finding in a prognostic way? I am sorry to say we are unable to answer.

R. T. LaVake, M.D., *Secretary.*

LIMITATION OF THE MANUFACTURE OF NARCOTIC DRUGS

In accordance with the provisions of the Hague convention of 1912, Congress made laws for controlling and regulating the production of and the traffic in the drugs mentioned by the convention. Now domestic production and traffic in these dangerous drugs is limited by federal law. The importation of opium and coca leaves into the United States is restricted. The enforcement of the laws have, however, not prevented the importation of drugs for illicit uses. Introduction of narcotic drugs by smugglers cannot be prevented until other countries control the manufacture and export of narcotic drugs adequately. To this end our government initiated the movement which resulted in the calling of the International Opium Commission at Shanghai in 1909 and since then has continued in its efforts along these lines. The manufacture of narcotic drugs must be limited to approximate medicinal and scientific needs. Physicians must aid in the determination of such needs by limiting their own prescribing to indispensable uses. The pitiful character of the drug addict and the association of drug addiction with crime and other menaces to the public welfare demand all the help that physicians can give in solving this problem. (Jour. A. M. A., May 9, 1931, p. 1623.)

PROCEEDINGS OF THE MINN APOLIS CLINICAL CLUB

Meeting of May 14, 1931

The regular monthly meeting of the Minneapo
Clinical Club was held on Thursday evening, May
1931, in the Lounge of the Medical Arts Buildi
After dinner, the meeting was called to order by
President, Dr. F. H. K. Schaaf, at 7 p. m.

After a short business meeting in which amendme
to the Constitution and By-Laws were voted upon,
following scientific program was given.

Dr. R. T. LaVake read a paper entitled "Preëclamp
Toxemia of Pregnancy":

The aim of this paper is to stress a clinical obser
tion that I believe to be of the greatest practical i
portance, namely, the increased likelihood of the acc
sion of preëclamptic toxemia of pregnancy coincid
with or as a sequel to any type of infection, focal
general.

This observation led me to espouse the infect
theory of eclampsia in an article appearing in the Oc
ber 15, 1916, number of the Northwestern Jour
Lancet. A continued study of this problem during
past fifteen years had convinced me that this obser
tion is of the greatest practical importance from
standpoints of prophylaxis and preparedness. It dire
the clearing up of all focal infection in teeth, tons
sinuses, etc., and when infection—focal or genera
cannot be avoided, it directs increased care in look
for the earliest signs of preëclamptic toxemia. Althou
no one has been able to prove the infection theory, i
my belief that it will eventually be proved.

I feel that this paper is timely because I have
finished a review of obstetrical literature to date on
subject and have visited many outstanding clinics
find that it is generally held that the infection the
has been discarded as untenable from the results
investigation; and the clinical observation of the
quency of the accession of this toxemia upon any t
of infection is not made and stressed.

As an example of the practical importance of giv
this theory careful attention, let me cite one case am
many. A woman normal in every way, whom I had
livered normally twice before, contracted in her seve
month of pregnancy what she designated as a c
It was apparently so slight an infection that it did
confine her to bed though it lasted a week and
was quiet during that time according to her physic
and herself. Three weeks later her urine was a
lutely normal and her blood pressure was 120/60
she said she felt in perfect condition. However,
history of infection put me on my guard and a w
later being called up by her and questioned as to
best thing to take for a slight headache, I insisted
I go out to see her. She demurred at this, saying
she and her husband were all dressed to go out to
ner and that my seeing her was unnecessary. I insis
however, and found her systolic pressure 240. We w
to the hospital instead of to the dinner. Labor was

d by bags and the case terminated well. She never a convulsion but I felt that early and prompt at- on should be given some credit in the result.

t us use this case as an example for theoretic oning and permit me to describe how I believe in- on brings about this condition. It must bring it it through its action upon the fetus or placenta and my belief from observation that it does so by pro- ng alterations in the placenta, generally grossly alized by infarctions, and that either autolysis of e infarctions causes the toxin, as brought out by ng of Edinburgh in 1914, or the alterations in the enta permit of products being absorbed from the s that produce the lesions. The frequent pro- nced improvement following intrauterine death of fetus lends some weight to the latter theory.

st because we do not know absolutely the cause of toxemia, do not let us ignore the possible signif- ce of the sequence of infection and toxemia. ecially, whether right or wrong, it can only act to ease our efficiency.

here are several stock arguments against the infec- theory that I would like to mention because they ediately deter many men from thinking further it it. One is: Nearly everyone during pregnancy have either some focal infection or some general ction, however slight. Why do not more women preëclamptic toxemia? One may say the same rheumatic fever. Has any one yet solved the prob- of why one will have joint involvement with a h or tonsil infection, and another not? A parallel ation may apply to alteration in the placenta.

nother argument is: The large majority of pla- æ show some infarction and yet only a small per- age develop toxemia. True, but one must consider the accession of toxemia depends upon the inability he excretory organs to take care of the toxin, what- it may be; and again, from my knowledge of the nation of the placenta, where every cell likely ob- s one-half of its proteins from the male side, no placentæ would be alike in their toxicity to that icular mother.

nother argument is that there is no evidence that rcts are even the results of infection. They may ust an evidence of an aging organ or the abnormal ation in a rapidly growing organ. I can merely that practically every placenta from patients mis- ying or having premature labor in the great Flu emic were filled with infarcts. This phenomenon rs in miscarriages during every general infection. eful gross observation of placentæ in general infec- directs attention to the likelihood of placental ation due to the infection. Otherwise why should e placentæ show such tremendous infarction com- d with placentæ from normal cases.

reëclamptic toxemias also show a greater average rction. Some of them, when not showing infarc- , show local areas of color change that suggest a y alteration. Whether or not these areas are the nnings of infarction, I am not prepared to state.

onclusion.—No theory of preëclamptic toxemia is of ter practical value than the infection theory. Keep it in mind for practical as well as experimental purposes until it can be absolutely disproved.

DISCUSSION

Dr. F. H. K. Schaaf: Of course, the relation of focal infection to sytemic disease is always going to be very much debated, and, while we may suspect it as a factor from a clinical standpoint, it will be difficult to prove our views from a pathological standpoint. This is true not only in preëclamptic toxemia but also in myocardial degeneration. Pathologists at the present time do not admit that focal infection can be a factor but at the same time we see many cases of myocardial degeneration where it is utterly impossible to find any other etiology. I fear there always will be arguments pro and con.

Dr. H. B. Dornblaser: I think this paper is very timely. I enjoyed it very much. On looking through my own records of preëclamptic toxemia, with the idea in mind of an infection as the cause, while not all of the cases had a note to the effect that the patient was suffering from infection, my recollection of some of them was that there had been some focus of infection present—a sinus, bad tooth, or something of the sort. When one looks at these cases with the idea of infection in mind, he often finds it is there although it did not seem to be a very big factor at the time. I think it is something obstetricians will have to watch carefully, and the essayist is to be congratulated on his prompt action in seeing the patient who complained of severe headache.

Dr. F. W. Wittich read a paper on "Indications for Therapeutic Abortion in Tuberculosis."

ABSTRACT

The influence of pregnancy on the tuberculous woman was noted in the early centuries. Statistics of various writers are noted showing that pregnancy is one of the leading factors in lighting up an inactive process—that in 30 to 40 per cent of married women pregnancy was responsible for lighting up an inactive process and that the disease proved fatal in about 30 per cent. The death rate is higher, the closer the period between the disease and the pregnancy and the more advanced the disease. Tuberculous women having sanatorium training do not become pregnant as often as normal women. Postpartum hemorrhages occurred in a very large proportion of the tuberculous women.

No bad effects were noted after 80 artificial abortions noted among the discharged Trudeau Sanatorium cases reported by Matthews and Bryant, and a few onsets and recurrences occurred after some of the 101 spontaneous abortions noted by them. Of their series 71 per cent of those who bore living children nursed their babies in spite of the general teaching against nursing by tuberculous women.

The writer studied a group of 515 definitely active cases of tuberculosis among women of all ages and stages of the disease from his private files between the years 1917 and 1931. One hundred seventy-eight gave histories of having one child or more, of which 95 are living and 83 are dead. Of 337 who gave a history of never having been pregnant, 169 are living and 168 are dead. Very little difference was noted between the number of deaths between the maternal and non-maternal group, although this is influenced by the fact that among this series were a comparatively large number of young women between the ages of 15 and 25 years who were never pregnant and who had rather an acute advanced stage at the first examination, where the disease was advanced beyond the stage where collapse therapy could be done, whereas the older maternal group presented more of the fibroid type more limited in extent and where artificial pneumothorax played an important factor in prolonging life. There were 23 induced abortions in the entire series, five of whom are dead, 16 living, and two untraced.

Abortions should be decided upon before the third month, or as early as possible, and never later than the fifth month. The active early cases are the most suitable and the moderately advanced less so. In cases complicated by hyperemesis or laryngeal tuberculosis, abortion should be done in the early months. Artificial abortion should never be done on a tuberculous suspect and collapse therapy in some form should be considered in all cases. The acuteness and rapidity of spread of the disease should be considered, as abortion influences cases with a rapid recent spread very little. Artificial abortion should not be done in any case unless the patient can have excellent care and undergo the strictest and accepted anti-tuberculosis measures, preferably in a sanatorium.

As the indications for such a procedure become more complicated where the symptoms, physical signs, X-ray, and knowledge of collapse therapy play an important role, it should be required of every tuberculous pregnant woman to have the benefit of the roentgenologist and the internist versed in the special therapeutics of tuberculosis, as well as the obstetrician. A thorough chest examination and, if possible, X-rays should be taken of every prospective mother as a routine prenatal procedure.

DISCUSSION

Dr. R. T. LaVake: This is a very timely paper. It has always seemed to me, in this question of tuberculosis and pregnancy, that the whole thing from beginning to end hinges on the questions: the perfection of sanatorium or sanatorium-like treatment, how much you can protect the patient from work at the time of labor, and how well you can keep the affected lung immobilized. I haven't had experience with phrenicotomy, but that seems to offer the best solution to this problem. I have never seen a case where pregnancy seemed to interfere with the well-being of the woman; in fact, it has always seemed to me she has felt better from the pregnancy, after the first three months, than she had ever felt before. The circulation of the extremities is bettered as a rule. I believe that pregnancy improves the general well-being of a woman. The same applies to the tuberculous woman but the danger lies after delivery when you change the position of the diaphragm, which is practically in the position that it is after phrenicotomy; it is suddenly allowed to come down and that just shoots the tubercle bacilli through the lungs. The reason, in my opinion, why abortion should be p formed before three months have elapsed is beca there has been no disturbance of the diaphragm and muscles have been brought into play. These patients loose a little blood, but often this is not in exce Personally, I believe that a woman who has h active tuberculosis within two years, if seen wit the first three months, should be advised to have t pregnancy terminated. Of course the religious fact and her own desires must be taken into considerati If she goes to delivery I think she should have phrenicotomy or a pneumothorax, and one can do cesarean under local if necessary to prevent all effo The vital capacity of the lungs is the same at the ti of delivery but the lungs are flattened from abo downward. As soon as the pregnancy is ended, the d phragm falls and the lungs resume their normal sha I think that a phrenicotomy or a pneumothorax is adv able. I have not used them, but have always advis putting a pillow over the uterus after delivery, th attempting to hold the diaphragm up. I believe that we could absolutely prohibit the change in the d phragm or the mechanics of the lung, the woman shou have no trouble at all. She should, however, be at sanatorium and under the best care.

Dr. H. B. Dornblaser: I was very much interest a week or so ago in attending a meeting at Glen La Sanatorium in which Dr. Jennings reported their s tistics for the last ten years on 35 cases of pregnan in the tuberculous patient. At first they picked th very sparingly, but have come to the conclusion t they can carry nearly any with tuberculosis through pregnancy. His statistics in the early cases were abo the same, whether the case was aborted or allowed go to term. They felt they had not gained much aborting them early. The majority of the women t have taken through their pregnancies, and their tub culosis was in no way advanced. They do sugg however, that the woman should be given as easy labor as possible, and should have the best possible c for the tuberculous patient afterwards, *i.e.,* should be bed for at least three months and go on a cure, and a that the baby should not nurse. I have a patient n who has an active tuberculosis and insists on goi through her pregnancy. When I first saw her I thoug it was suicidal to do it. She had been a patient Glen Lake. She says that as soon as the delivery over she will take a cure either at home or go to G Lake.

Dr. F. H. K. Schaaf: It seems to me that we h to consider each case individually and make a decis accordingly. Firm and fixed rules cannot be formula for any therapeutic procedure.

Dr. LaVake: In the case Dr. Dornblaser just m tioned, if I may offer a suggestion, when that wom delivers I certainly think she should have a pneum thorax or phrenicotomy or she may not get to the sa torium after delivery. When that diaphragm co down it is too late, but with either of these procedu there is less chance of that happening. I have s cases, apparently well at an easy delivery, cough u teacupful of pus filled with tubercle bacilli a few d er and die within a few weeks. I don't think that ould occur now with the means at hand for lung im- obilization.

Dr. J. M. Hayes: I would like to ask if Dr. Dorn- aser's case is bilateral tuberculosis?

Dr. Dornblaser: Yes.

Dr. E. S. Platou: Are all cases of pulmonary tuber- losis with pregnancy suitable for immobilization and ien is the optimum time for such immobilization?

Dr. R. C. Webb: Are there any objections to renicotomy, or would it be preferable to crush the renic nerve and let it recover at a later date?

Dr. Wittich: I think, but am not positive, that Dr. nsella just crushed the nerve in some of his earlier ses, but I do not see why it should not be pulled out get as much fixation of the diaphragm as possible.

Dr. Webb: Then you don't do phrenicotomy as a ophylactic measure; but should it have been done be- re?

Dr. Wittich: It should have been done previously rhaps if the disease had been detected before the egnancy where this procedure is indicated, but the egnancy may be the only indication for phrenic eresis. It is rather difficult to get the patient's con- nt sometimes, and then again many physicians are not miliar enough with the procedure or realize its im- rtance in these cases. Personally, I prefer to do eumothorax if possible, taking the side having the ost disease, when the lung can be allowed to re-expand results are not obtained, or there is increased activity the opposite lung. Phrenic exeresis is a permanent ing and this may not always be desirable.

Dr. E. T. Evans: On the other hand you have had period of four months in which it was doing some od.

Dr. Webb: If phrenicotomy is better why would you en consider pneumothorax unless you had some ob- ction to phrenicotomy?

Dr. Wittich: Pneumothorax has always seemed a mple procedure to me. Besides a phrenicotomy pro- ices far from the satisfactory collapse that a pneumo- iorax will give; the former, however, is certainly a ost valuable procedure when indicated.

Dr. LaVake: It would seem to me that phreni- tomy would be better, then you could do a cesarean, id I do not think it would hurt the woman at all.

Dr. Webb: I think some years ago Dr. Wittich read paper on the relation of vital capacity to post-opera- ve risk. Can a patient hold the breath as long after irenicotomy as before?

Dr. Wittich: No, but the vital capacity gradually proaches its former level.

Dr. Webb: Then you would prefer pneumothorax ecause the lung comes back afterwards, while with irenicotomy you have lost the action of the dia- iragm?

Dr. LaVake: One thing which has not been brought it and which seems to be a very wise thing, and that that every patient who has had tuberculosis within vo years the patient should be given advice not to become pregnant until the lesion is entirely gone. I do not believe they get such advice.

Dr. Platou: It is true that some women never suspect they have had tuberculosis and after having a baby break down with rapidly progressive tuberculosis.

Dr. LaVake: I think Dr. Wittich mentioned there were about 33 per cent.

Dr. Platou: Don't you think that is a good argument for a very careful study of the patient who becomes pregnant, with at least one routine chest plate during her course?

Dr. LaVake: I am of the opinion that that diaphragm must never move once. One case was very interesting to me. This woman had aborted twice by herself. I think every woman who has aborted should be gone over by an internist to find out if she has a focal infection. The third time she did not abort. She was a patient of Dr. Bell and we went over her very carefully and then advised abortion. She refused, went out to Colorado, and died three weeks after delivery.

Dr. F. W. Wittich reported the following case and showed the two complete specimens of diphyllobothrium latum or fish tapeworm. These specimens were passed by a native born Jewish woman 65 years of age after vigorous anthelmintic treatment. She had had a moderate diabetes mellitus for about five years and four years ago entered the hospital, where she underwent treatment for worms, but the physician failed to get the heads. There were little or no sympatoms. She presented a moderate secondary anemia. Attention is here called to Dr. Moses Barron's excellent paper in the Journal of the American Medical Association of May 11, 1929, reporting 19 cases among native born Americans, four of whom were his own cases. He calls attention to the fact that the majority are Jewish, and mostly women, who are accustomed to tasting from time to time, for proper seasoning, the raw minced fish while preparing the commonly used Jewish dish of "gefüllte fish." The woman gave this history. She had frequently tasted the raw minced fish in the preparation of this fish.

The one specimen shown is 18 feet long and the other seven feet long. These worms are often eight meters in length. Attention is called to the lateral slit in the head and to the split tails. It is noted that, besides man, the dog, cat and fox have been found to be infested; that there are two intermediary hosts: the first larval stage developing in infested crustaceans from ova discharged in the stools, and the second larval stage in the body of the fish from ingesting infected cyclops, or from eating infected young fish.

Magath and others have shown that some of the northern lakes of Minnesota are heavily infested, especially the pike and pickerel. The larval worms are also seen in carp.

The treatment in this case was as follows: For three days before entering the hospital, the patient ate lightly of milk, milk toast, cereals, broth and coffee. On each of these days she was given a tablespoonful of a solution of Epsom salts containing spirits of chloroform 15 c.c. and 60 grams of magnesium sulphate to 200 c.c.

of water, three times daily before meals. The night before entering the hospital a double dose of the salts mixture was given and a soap and water cleansing enema, and the patient took no food and but little liquid. The patient entered the hospital before 9 o'clock the next morning, when four 0.5 gm. capsules of oleoresin aspidium was given. This dose was repeated at 10 o'clock. The capsules were uncapped before giving. At 12 o'clock 3 tablespoonfuls of the salts mixture was given to prevent absorption of the male fern.

The patient remained in bed the entire day, taking only some black coffee and a little bouillon during the morning. In the afternoon the patient was given a light diet. All specimens were carefully searched by straining through gauze, and a final high cleansing enema was given that night.

H. Bright Dornblaser, M.D.,
Secretary.

"DISEASED" BUILDINGS

Several articles have appeared recently in medical journals calling attention to inaccuracies often noted in scientific terminology, or nomenclature, not only in secular periodicals and newspapers but in technical bulletins as well.

A well known tuberculosis laboratory has issued a circular announcing that a "Tubercular Building" for children was to be erected. This is a misnomer commonly used even among medical workers. Those who know have repeatedly pointed out that a diseased organ may be "tubercular," but the patient is "tuberculous." It is to be hoped that the building in question will not suffer from this type of organic condition, at any rate not for some years to come.

In the field of mental hygiene it has been necessary to explain to the uninitiated the difference between "mental defect" and "mental disease." But we too have been careless with our psychiatric vocabulary. Why the "Psychopathic Hospital"? There may be "psychopathic social workers" but state hospitals and mental hygiene clinics try as far as possible to employ safe and sane "psychiatric" social workers. Facetiously, and for the sake of brevity, professional workers have referred to students of mental deficiency as the "feebleminded group."

"Insane" is a good old fashioned word, try as we might to discard it as a medical term, but why announce, as does a current bulletin, that the foundations have been completed for two "disturbed buildings" and two "epileptic buildings" for the blank "insane hospital"? Have you ever seen a "nervous hospital"? But even the purist is stumped at "mental institutions," the phrase has come into such general use. The technologists have given us the televox, the electric man and the robot, but it takes a psychiatrist to endow a hospital for the insane with mind.—*National Committee for Mental Hygiene.*

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles whi they run across in their reading and send the abstra to the physicians in charge of the respective sections. order to avoid duplication it would be well to commu cate with one of the section supervisors before t article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bl
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bl
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

CHOLESTEATOMA: Alexander Retjo (Arcl Otolaryng., May, 1931, Vol. 13, p. 709). Microscop examination of material from the suspected case an the roentgen ray do not give useful information in large percentage of cases. Virchow brought out th fact that cholesterol is not peculiar to the cholesteatom masses, since it is found in many other parts of th body. The cholesterol content of these epithelial masse is exceedingly inconstant and varied (Lucæ). Salkow ski's investigations showed that although there is alway cholesterol in the cholesteatoma, it may be in an amo phous state instead of in the crystalline form. Crysta line cholesterol is an alcohol of high valence; th amorphous cholesterol is its ester. Lautenschlager dem onstrated that the agent that destroys the bone is th chemical effect of cholesterol and not the mechanical pressure of the tumor as was formerly believed.

According to Salkowski's estimate, there is 10.6 per cent cholesterol that is cholesterol ester in the normal epidermis and 18 to 23 per cent in the cholesteatoma of the middle ear. The content of cholesterol found in the normal epidermis may be doubled in pathological conditions. As to the causes and conditions that produce this variation, it is known that epidermis normally grows in dry surroundings, that is, in contact with air, but becomes degenerated and changes to matrix in the presence of moisture when air is absent and in a dark place. The author, observing the deleterious effect of aqueous solutions on the effort of nature to epidermatize a deep aural space, sought a substance capable of drying and also of dissolving cholesteatomatous masses. He is now using carbon tetrachloride for this purpose.

For the chemical demonstration of cholesteatoma, the author has applied Bloor's method to the examination of the barbon tetrachloride extract and devised a colorimeter for index of the quantity of cholesteatomatous material. The author hopes that others will apply his method so that larger series will be reported.

Lawrence R. Boies.

SINUSITIS IN CHILDREN: Henry A. Riesman. (Archiv. Ped., May, 1931, Vol. XLVIII, Page 283). In climates similar to that of New York City, sinusitis is a disease fast becoming a problem of paramount importance, because of its increasing prevalence, the difficulties in diagnosis, the resistance of sinusitis to treatment, and its complications and sequelæ. Marriot is quoted, who stated that more than one-half of the children in hospital wards are under treatment for some form of paranasal sinus infection regardless of the diagnosis on admission.

Two diagnostic signs additional to those commonly sought for are emphasized: the enlargement of retropharyngeal glands apparent directly behind the posterior tonsillar pillars, and the elicitation of submaxillary tenderness at the midline of the body of the mandible.

The author has found, in a comparatively large number of cases, secondary pulmonary infection resulting from a primary sinusitis to involve the central lung field, and to present a picture so similar as to be at times very confusing with that of juvenile tuberculosis.

The relationship between avitaminosis and accessory nasal sinus infection must be an indirect one, probably due to the lowered resistance of the cells of the upper air passages to infection. If this were not so, then our diet treatment for sinusitis, rich in all the vitamins, would be either specific or at least more successful, which is not the case. There is no doubt, however, that a diet rich in fat is beneficial.

The difficulty of X-raying children and the short duration of the infection may be factors in obtaining negative findings in the presence of positive clinical evidence corroborated by nose and throat consultation.

The author believes, despite contradictory opinions regarding the use of vaccines, that if the vaccine is autogenous and properly prepared and given, a greater resistance to nose and throat infections is developed. Though it may be temporary, the treatment is justified. Details of the author's method of preparation and administration of the vaccine are given. He recommends a diet high in fat and protein and comparatively low in carbohydrate—essentially the diet used in tuberculosis. Alpine therapy is considered to be of minor value. Rest and the prevention of over-fatigue are important.

Lawrence R. Boies.

THE PROGNOSTIC VALUE OF EXAMINATION OF THE BLOOD IN OTOLOGY. Arthur Weiss (Arch. Otolaryng., May, 1931, Vol. 13, Page 647). Weiss reports a study of the leukocytes in acute otologic infections, evaluating the usefulness of interpreting the differential study according to the method of Schilling. To quote the author: "The physician of yesterday, depending on the number of leukocytes and the percentage of polymorphonuclears for his information in cases of severe infections, often found himself unable to explain apparently contradictory relationships. With the appearance of the work of Arneth and Schilling, this apparently false relationship was clarified and explained. Today, while the actual number of leukocytes is of but casual importance, the number of immature neutrophils or staff cells has achieved the center of the stage."

The author has found that for matters of diagnosis, inconsistencies exist in the reactions called forth by the various types of disease, and therefore the immature count is not of particular use as an aid to diagnosis. For instance, a case, of acute otitis media purulenta, which usually precedes the infection of the mastoid, may give a more active response than the latter. This, Weiss explains by suggesting that infection of the middle ear and sinus often result in a severe systemic involvement, whereas infection of the mastoid, usually only a localizing or pointing of the otitic inflammation, causes few if any symptoms and either gives normal figures in examination of the blood or shows evidence of slight stimulation.

His conclusions emphasize the following:

1. A rise in the percentage of staff cells indicates the presence of some postoperative complication, though the complication may not be in the postoperative area. 2. The leukocyte and staff counts are often much higher in acute otitis media purulenta than in acute mastoiditis. 3. All cases of mastoiditis with venous complications show marked changes in the blood picture. 4. The blood count when used in series is of inestimable importance in prognosis.

(Comment: In a paper on the same subject in the February Archives of Otolaryngology, I brought out the fact that the immature count reflects the intensity of the toxemia. Whether the toxemia results from otitis media alone, or from mastoiditis or a complication, there are factors both anatomical and bacteriological in the course of the suppurative process which influence the degree of toxemia. The immature count is an aid to diagnosis to the extent of information as to the balance between invasion and resistance, in some instances of which the usual manifestations are not prominent.)

LAWRENCE R. BOIES.

MEDICINE

TUBERCULOSIS ABSTRACTS*

The Twenty-seventh Annual Meeeting of the National Tuberculosis Association, held at Syracuse, New York, May 11-14, 1931, was attended by 1,010 registrants. Papers and discussions dealing with the pathological, clinical, social, and administrative aspects of tuberculosis furnished a well balanced program. While most of the papers were of interest primarily to specialist groups, all contributed to our general knowledge of tuberculosis. All papers, either in their entirety or as comprehensive abstracts, will be published a few months hence in "Transactions of the National Tuberculosis Association." A few high lights of general interest are here presented.

TUBERCULOSIS WORKERS REPORT PROGRESS AT ANNUAL MEETING

The opening session celebrated the twenty-fifth anniversary of the Christmas seal, the device which made possible the financing of the tuberculosis movement in the United States. Miss Emily P. Bissell, who introduced the seal in this country, was the guest of honor.

Dr. Livingston Farrand, president of Cornell University, who served as executive secretary of the National Tuberculosis Association from 1905 to 1914, described how the Christmas seal sale grew from $3,000 in 1910 to $5,350,000 in 1930. The total receipts from this method of fund raising in the United States have aggregated $58,640,000. This money has been used largely for the promotion of official measures designed to combat tuberculosis, and by this means there have been secured from the public purse sums that aggregate at the present time close to $500,000,000. "Christmas seals invested in community organization have resulted in dividends of incalculable benefit."

Emily P. Bissell recounted the origin of the Christmas seal. She was interested in 1907 in raising a few hundred dollars to provide a small sanatorium of 8 beds for consumptives in Wilmington, Delaware. Having read Jacob Riis' description of the Danish Christmas seal in "The Outlook," she decided to adopt the method. The first seal issued aroused scant interest until "The Philadelphia North American" gave it publicity and proved the possibilities of raising money through the sale of penny stickers. The seal was not a sudden inspiration or a detached idea. As a social worker, Miss Bissell had learned that fairly large subscriptions may be obtained for a worthy project from a few individuals if it is explained to them. But the real public, the people who can afford to give from ten cents to one dollar, are difficult to reach. The Christmas seal makes it possible for all to participate and also enlists widespread individual interest in the problem of tuberculosis.

MEDICAL RESEARCH

Dr. Florence R. Sabin outlined the program of the Committee on Medical Research under the chairmanship of Dr. William Charles White. Under the plan, various universities and laboratories throughout the country coöperate in the solution of carefully outlined problems. All the groups engaged in the work meet frequently and discuss their progress.

One of the projects is that of subjecting strains of acid-fast bacilli, of which the tubercle bacillus is one, to chemical analysis. The essential foundation for such a survey is a synthetic culture medium of known and constant composition free from any protein, complex carbohydrates, and lipoids. The various products of the medium, as well as the chemical fractions of the tubercle bacillus, are submitted to biological tests in order to determine the specific physiological reaction of each fraction or pure substance. For example, saturated fatty acids derived from the tubercle bacillus reproduce typical tubercles in animals. Both proteins and carbohydrates derived from the tubercle bacillus reproduce the toxic symptoms characteristic of the disease. After each new fraction of the tubercle bacillus is isolated, it is tested in the biological laboratory, the end in view being to formulate a complete catalogue of the component parts and their physiological reactions.

Other studies include an investigation into the physiology, particularly the respiration rate, of living tubercle bacilli. One worker has devised a means of isolating a single bacillus and watching its entire life cycle under the microscope. Another group is attempting to standardize the reading of X-ray plates and the construction of X-ray equipment.

NEW DISCOVERIES ANNOUNCED

At the meeting of the American Sanatorium Association, one of the affiliated groups, several important research developments were announced. Dr. E. Fenger of Glen Lake Sanatorium, Minnesota, speaking for the group who participated with him, reported on a new tuberculin known as MA-100. This is a protein common to all acid-fast bacilli. The combined results of several investigators justified the opinion that the new tuberculin possesses four distinct advantages: (1) it is free from all substances that might render the positive reaction uncertain; (2) it can always be produced at the same iso-electric point in precipitation; (3) it contains nothing except what is manufactured by the germ of tuberculosis itself; (4) it can be diluted in quantity accurately to enable every physician to know exactly how much of the active element he is using.

Professor Charles Weyl of the University of Pennsylvania, technical adviser of a group headed by Dr. F. Maurice McPhedran who are endeavoring to standardize X-ray equipment, announced a method of making X-ray pictures of the chest so synchronized as to take several short exposures between heart beats. The resulting composite negative produces a clear picture free from blurring caused by the heart's action. Professor Weyl compared the mechanism of the apparatus with that used in a combat airplane, whereby machine gun bullets may be shot between the whirring propeller blades. The device marks a step in advance towards standardizing X-ray pictres.

---

*Reprinted from Tuberculosis Abstracts, a review for physicians, issued monthly by the National Tuberculosis Association. August, 1931, Vol. IV, No. 8.

Another advance in the work with the X-ray was made public at the meeting by the same group, who have been attempting for several years to eliminate variations in the results obtained with different X-ray machines. Differences in lighting and mechanical action of apparatuses heretofore have made the accurate reading of negatives depend upon due allowances for peculiarities known to exist in the operation of the individual machine. For example, pictures made in one city with a certain apparatus would be found, if the patient moved to another city, to be of little use in diagnosing progress of tuberculosis because the second physician would not be conversant with the variables characteristic of the first machine.

By means of an instrument called a "comparator densitometer," designed and constructed by the group making the report, a standard is established which the operator can use to know in advance of taking the X-ray that a certain established density in the picture will be obtained. This enables physicians in different parts of the country to work with X-rays upon a uniform basis, as well as reducing the variations that have stood in the way of accurate judgment.

In addition to these developments, it was announced at the meeting that a fixed resistor has been designed which will test the supply of electrical current; also a peak voltmeter for vacuum tubes, and a standard testing apparatus which will help hospitals, sanatoria, and laboratories to choose the X-ray machine best suited to their needs.

EXPANSION OF TUBERCULOSIS ASSOCIATIONS

Harry L. Hopkins, director of the New York Tuberculosis and Health Association, discussed the question, "Should the Tuberculosis Association Go into Other Health Fields?" The rapid decline of the tuberclosis death rate and the wide increase of public facilities, such as sanatoria, clinics, health departments, and nurses, warrant the tuberculosis associations in giving serious thought to future programs. The campaign against tuberculosis has by no means been won; an aggressive warfare must be continued, but it should no longer be in the form of direct services rendered. Rather should it be to encourage public authorities to provide funds for adequate sanatorium beds, more tuberculosis clinics, more nurses, and more tuberculosis physicians. Its direct services should be limited to health education, and even here more efforts should be made to induce the public authorities to extend their own facilities. Associations can properly take part in direct activities of a research nature and more particularly those that are demonstrations in character.

Tuberculosis associations, national, state, and local, are admirably equipped to extend their efforts in combating other forms of disease and in promoting positive public health work. Among the projects that have already been undertaken by certain associations are the campaigns against diphtheria and heart disease, the promotion of mental hygiene, child health work, and social hygiene.

OFFICERS ELECTED

The officers of the National Tuberculosis Association elected for the ensuing year are: president, Dr. Alfred Henry, Indianapolis; vice-presidents, Dr. John H. Peck, Des Moines, and Dr. Willard B. Soper, West Haven Connecticut; secretary, Dr. Charles J. Hatfield, Philadelphia; treasurer, Henry B. Platt, New York City. Officers of the American Sanatorium Association, whose sessions were held simultaneously, are: president, Dr. Harry Lee Barnes, Wallum Lake, Rhode Island; vice-president, Dr. Fred H. Heise, Trudeau, New York; secretary, Dr. W. H. Ordway, Mt. McGregor, New York.

The Trudeau Medal "for the most meritorious contribution on the cause, prevention or treatment of tuberculosis" was awarded this year to Dr. Allen K. Krause.

THE RELATION BETWEEN ALLERGY AND IMMUNITY IN TUBERCULOSIS: Max Pinner (Amer. Rev. of Tuberc., 1931, XXIII, 174). The relation between allergy and immunity is the subject of many experimental and clinical studies. The term "immunity" is used by different writers with a disconcerting variety of meanings. Pinner defines it as "a condition which is in a specific way subservient to the existence of the biological entity whose integrity is attacked by a specific agent."

The following questions should be answered: is allergy desirable or not? is it instrumental in warding off infection? does it mitigate the destructive effects of reinfection? does it promote healing processes?

Fibrosis seems to occur only in allergic soil. The great frequency of healing and completely healed foci should be pointed out. "Fixation" of bacilli is instrumental in tuberculo-immunity. On the other hand only an allergic animal can be killed within a brief time by an infection with tubercle bacilli. Only in allergic soil does an infection cause acute and toxic conditions of exudative foci with rapid caseation. Whether fibrosis develops more rapidly with a high degree of allergy is not settled. Both healing and progression may proceed under the same condition of allergy. The attempt has been made to establish a quantitative relation between a phenomenon defined by its causation (allergy) and one defined by its purposive (teleological) significance (immunity). The one cannot logically go hand in hand with the other. It then cannot be decided whether immunity or hypersusceptibility is by necessity linked with allergy. It is impossible to establish a causal relation between them. Immunity depends not only on the condition of the organism in question but on extrinsic factors as well, such as dosage and virulence of the infecting micro-organisms, portal of entry, etc.

It is not permissible to ascribe all healing processes to specific immunity, for constitutional factors, environmental influences, mechanical conditions in the local lesion, and many more factors decide the clinical course.

The attempt to correlate allergy and immunity quantitatively is doomed to failure because the two are incomparable concepts. Immunity cannot be measured in terms of allergy for the same reason. The clinician should not try to correlate a strong tuberculin reaction with high immunity, nor will he find the reverse relation to hold true. The elusive nature of immunity, whose doings are obscured by many extrinsic factors, cannot be recognized nor measured until the disease has run its course.

The elimination of the term immunity from clinical usage will more clearly show the pressing need to study carefully the influence which allergy has on pathological processes. It should be possible by close clinical observation to decide definitely whether a high or a low degree of allergy influences favorably, resorption, fibrosis or calcification. The fact that the answers to such questions are not available today deprives us of the opportunity to use one possibly powerful weapon against the disease, namely, the controlled alteration of the intensity of the allergic state.

A. T. Laird, M.D.

PEDIATRICS

THE MORO REFLEX AS A DIAGNOSTIC AID IN FRACTURE OF THE CLAVICLE IN THE NEW-BORN INFANT: Heyworth N. Sanford, M.D., Chicago (Amer. Jour. Dis. Children, June, 1931, Volume 41, Number 6). Fracture of the clavicle in the newborn infant is the most frequent fracture occurring during delivery. Statistics show that this fracture occurs in one per cent of all births. It may result from manipulation during delivery, but it is by no means rare in spontaneous birth, especially when the mother is a multipara.

Moro found that on placing an infant on a table and then forcibly striking the table on either side of the child, a motor reaction is obtained. The arms are suddenly thrown out in an embrace attitude, describing an arc and tending to approach one another with a slight tremor; the fingers are at first spread and then closed. Gordon in examining eighty-five infants during the first month of life found that all gave a positive Moro reflex. He thought that the absence of the embrace reflex on one side is an indication of either motor paralysis or injury on that side.

There are several conditions in which this reflex is absent symmetrically for various periods of time during the first ten days, but the author has not seen any cases in which it was asymmetrical for more than the first twenty-four hours, except in fracture of the clavicle. On the side of fracture there is no response.

In 465 new-born infants, six cases of fracture of the clavicle occurred. This was the only condition in which the Moro reflex was asymmetrical, no reflex being obtained on the side of the fracture.

R. N. Andrews, M.D.

APPENDICITIS IN CHILDREN: R. Franklin Carter, M.D., New York (Arch. of Ped., Vol. XLVIII, No. 6, June, 1931). The high mortality of acute appendicitis in childhood should be an incentive for a closer scrutiny of those patients who present symptoms of abdominal distress that may be the forerunner of the usual symptom-complex of acute appendicitis.

Primarily then, a consideration of the anatomy of the organ should be taken up. And it will be found to be a vestigial structure, subject to great variation in size, length, position, and in its relation to the ileum and cecum. The meso-appendix, in which the artery from the ileocolic vessel descends to supply the appendix, is also subject to great variation in length by which both the artery and the appendix may be affected in that the appendix may be thrown into coils or angulated at its base in case of a short mesentery and the return flow of blood hampered from pressure of the constricted vessels.

From a consideration of the anatomical peculiarities of this organ it will be seen that the stage is set for the primary step in the development of the acute appendicitis, viz., constriction of the lumen of the appendix. In view of the amount of lymphoid tissue in the appendix, any irritation is likely to cause a constriction from hypertrophy of its lymphoid tissue.

The associated nausea and vomiting of an appendicitis in the chronic stage is usually referable to eating. Frequently nausea or vomiting occurs during or immediately after eating and rarely do they occur definitely with the occurrence of the pain. It all is the result of a pylorospasm, which is a reflex from the intermittent appendicular irritation.

In the usual uncomplicated case of appendicitis, the further examination consists in a complete urinalysis, to further eliminate the kidney as a source; a complete blood count with eosinophilia determination; and a gastro-intestinal X-ray.

In addition to the acute appendices that result from the above process, there is a definite group of fulminating appendicitis cases, usually of the streptococcus type, that occur without prodromal symptoms and in which at operation the appendix may be found to have none of the developmental astigmata associated with the more common appendicitis that this paper deals with

R. N. Andrews, M.D.

THE MECHANISM OF THE KETOGENIC DIET IN EPILEPSY: E. M. Bridge and L. V. Tob (Bull. Johns Hopkins Hosp., XLVIII, 373, June, 1931): In order to test the hypothesis that improvement from the ketogenic diet parallels the tendency to remove fluid stores from the body, Bridge and Tob studied three pairs of girls subject to frequent attacks of petit mal. As a result of these studies they arrived at the following conclusions:

"Neither the ketosis nor the acidosis accompanying the so-called ketogenic treatments for epilepsy can be considered the sole beneficial factor of such regimes.

"Experiments are reported showing that if the high fat diet has succeeded in removing a surplus of extracellular fluid from the body, improvement in seizures is associated; if the diet has not removed this fluid, it has not affected the course of the disease.

“Since a simple acidosis and a sodium-free diet also end to produce similar losses of fluid from the body, asting may be considered a triple mechanism—high fat iet, sodium-free diet and acidosis—for the removal of xtracellular fluid, while the ketogenic diet has only vo factors—high fat diet and acidosis.

‘Since no ketogenic diet can be considered a failure ntil it has failed to maintain the good effects of fastng, it is believed that the institution of the high fat iet should always be preceded by a minimum of five ays of complete starvation, water only being allowed.

“Although the data presented have been obtained from hildren with petit mal epilepsy, there is no apparent eason to suppose that they do not apply to children ith major convulsions as well.”

C. A. Stewart, M.D.

ROENTGENOLOGY

DIAGNOSIS AND TREATMENT OF THE SO-ALLED SCIATIC NEURALGIAS: Gaston Labot, I.D., and M. B. Green, M.D., New York City (Amer. our. of Surg., Volume XI, Number 3, March, 1931, age 435). The authors review the subject of the soalled sciatic neuralgias, giving a modern method of reatment, and review ten cases, illustrative of the diferent types in which this disease appears clinically.

The so-called sciatic neuralgias include not only painul conditions of the sciatic nerves, but of the external utaneous and anterior crural nerves. It is of clinical nportance to make a correct diagnosis of the exact erves involved. For the localization of these involved reas, the authors use an electric percussion hammer.

Instead of caudal or epidural blocking, which is genrally used, the authors recommend individual blocking f the involved nerves, in this way avoiding impairment f vesical and anal sphincters, as well as weakness of oth lower extremities. Through blocking, the circulaion of the infected side is improved, giving greater omfort to the patient.

The solution used is a mixture of alcohol and neocain, nade up as follows: Alcohol 95 per cent, solution neoain 2 per cent; the above two mixed in the proportion f 1 to 4 or 5.

Physiotherapy, in the form of diathermy, infra-red ays, and massage, is generally used. The authors think that diathermy does not give as satisfactory results as infra-red rays and massage. Each case must be individualized and the different changes explained to the patient after the blocking treatment.

One big advantage of nerve blocking is that it avoids addiction to harmful narcotic drugs. This method is also used in relieving painful conditions, associated with productive osteoarthritis. The period of relief varies, and cannot be foretold in the individual case; but in general the experience with this individualized and selected form of nerve blocking has given encouraging results, and is worthy of further development.

A. E. Sohmer, M.D.

SURGERY

COCCIDIODAL GRANULOMA — ROENTGEN DIAGNOSIS: Roy A. Carter, M.D. (Amer. Jour. Roentgen., XXV, No. 6, June, 1931, p. 715): The author presents a very complete review of the literature on this subject. Etiology, pathology, treatment, clinical manifestations, diagnosis, lesions of bone and intrathoracic involvement are each considered fully. An excellent review of the entire subject is presented. The value of roentgen examination in this disease is brought out.

The author stresses the following points. Coccidiodal granuloma is roentgenographically similar to tuberculosis. Features of pulmonary and osseous involvement will in some cases permit a provisional diagnosis between them. The association of pulmonary and extrapulmonary lesions in some cases is suggestive. The roentgenoolgist may thus promote recognition of the disease although he cannot make a positive diagnosis. The resemblance to blastomycosis is greater than to tuberculosis, and distinction would seem difficult, if not impossible. In viewing films of osteomyelitis and tuberculous-like lesions of lungs, the possibility of coccidiodal granuloma, blastomycosis and other infectious granulomata may be considered. The frequent occurrence of infectious granulomata of undetermined origin suggests a field of future study.

The article is well illustrated by many plates showing lesions both in bones and lung.

J. Sagel, M.D.

EFFECTS OF FEMALE SEX HORMONE ON CONCEPTION

Experiments on guinea-pigs, made with a view of deermining the effects of injections of the female sex ormone on conception and on pregnancy, showed that he female sex hormone is the active agent in producng estrus. In previous studies it had been found that njections of the serum from pregnant women would elay the onset of estrus in guinea-pigs. These obervations would seem to indicate an antithetic action etween the female sex hormone and the corpus luteum hormone. Other experiments have indicated that the injection of the female sex hormone into pregnant white rats would terminate the pregnancy if it had not exceeded five days. Other investigators also, using white mice, were able to prevent conception and to interrupt pregnancy at any stage with comparatively small doses of the sex hormone. With guinea-pigs small doses of the female sex hormone prevented conception and with larger doses it was possible to interrupt pregnancy and in some cases caused the death of the mother. (Jour. A. M. A., May 16, 1931, p. 1698.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

TEXTBOOK OF HUMAN EMBRYOLOGY. Cleveland Sylvester Simkins, Ph.D., Associate Professor of Anatomy, University of Tennessee Medical School. 8 Vo., 436 pages of text and 263 illustrations. Price, $4.50. F. A. Davis Co., Publishers.

Professor Simkins has brought together the information up to date on human embryology. It is refreshing to one long out of medical school to take this book and find how much new material and research work has been added to human embryology. The text is done in a terse and yet comprehensive way. The work, of necessity, is a compilation from many sources, but the personality of the author carries along with you through the pages of the well written text a conviction that the work has been well done.

As the author has stated in his preface, "the rapid accumulation of information regarding physiology of reproduction in the human has created a need for a students' text that would incorporate the essential bits of information now available." This part of the text will be particularly edifying to those who have been out of the medical school ten years or more.

The author has drawn freely from all available sources illustrations which assist remarkably in elucidating the text. There is a bibliography of 252 titles which adds materially to the value of the book.

This book can be well recommended to the student and to the physician who wishes to keep abreast of the more recent work done in embryology, which may be of much aid to him in his own restricted field of medicine.

John C. Brown, M.D.

ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1930. Cloth. Price, $1.00. Pp. 91. Chicago: American Medical Association, 1931.

This book is essentially a record of the negative actions of that distinguished body, the Council on Pharmacy and Chemistry of the American Medical Association; that is, it sets forth the findings concerning medicinal preparations which the Council has voted to be unacceptable for recognition and use by the medical profession. Many of the reports record outright rejection or the rescinding of previous acceptances; others report in a preliminary way on products which appear to have promise but are not yet sufficiently tested or controlled to be ready for general use by the profession.

Among the reports recording outright rejection are those on: Avesan (H), formerly Nuforal, a mixture stated to be composed of formic acid, sodium nucleinate, camphor, allyl sulphide and chlorophyll, with traces of salicin and sulphuric ether, marketed with unwarranted claims of usefulness in the treatment of tuberculosis, asthma, and other respiratory diseases; Ceanothyn, once before rejected and still found to be marketed with unsupported therapeutic claims; Collosol Calcium and Collosol Kaolin, so-called colloidal preparations, the former an unscientific mixture of unproved value, the latter a possibly dangerous preparation, and both marketed with unwarranted claims; Ephedrol with Ethylmorphine Hydrochloride, an unscientific ephedrine preparation marketed under an unacceptable proprietary name with unwarranted therapeutic claims; Farastan, an unscientific iodine-cinchophen preparation proposed for routine use in "arthritis . . . and Rheumatoid conditions"; Haley's M-O Magnesia-Oil, a magnesia magma and liquid petrolatum mixture in fixed proportions marketed with emphasis on the "M-O"; Lydin, a testicular extract, marketed with claims of value in the treatment of impotence; and Metatone, a shot-gun "tonic" mixture marketed under a proprietary name with unwarranted therapeutic claims.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

OFFICE SPACE suitable for doctor and dentist. Lake of the Isles district. Before August 1st. J. R. Huntsicker, West High Pharmacy, 2755 Hennepin, Minneapolis.

WANTED—Position as hospital laboratory technician or physician's office assistant. Training in Chicago hospital. Good references. Viola Witt, Northfield, Minnesota.

WANTED—Scandinavian surgeon of thorough training and pleasing personality for Northwest clinic group. Possible permanent connection. Address D-142, care Minnesota Medicine.

WANTED—Young internist with X-ray experience for clinic group. Norwegian preferred. No investment required. Address D-141, care Minnesota Medicine.

MINNESOTA MEDICINE

ournal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

ol. XIV SEPTEMBER, 1931 No. 9

THE DOCTOR TAKES A HAND IN VETERANS' RELIEF

C. B. Wright, M.D.
Minneapolis

A GREAT deal of interesting and significant data and opinion came to light in the course f recent discussions of the medical and hospi- lization program and policy of the Federal gov- rnment at the Philadelphia meeting of the merican Medical Association. Several speak- rs pointed out to the House of Delegates of that rganization that the present program, unless odified considerably, is likely to lead eventually a government hospital in each congressional istrict and to unlimited expenditures, increasing rom year to year as the millions of former serv- e men need medical service or hospitalization r disabilities incurred during civilian life.

It was pointed out at this meeting that all this xpenditure is justifiable only if it is for the best terests of the veteran. The preponderance of pinion was that for the veterans themselves it eld no assurance of better service than they ight receive privately from civilian physicians nd in civilian hospitals, while, on the other and, there was the very real danger of making ore and more of them into "institutionalized ases."

DISABILITY INSURANCE A BETTER METHOD

A better method of handling the situation, in iew of the fact that the government has already nbarked upon the policy of medical and hospi- l service for all veterans, regardless of the ori- ins of their disabilities, was outlined in a reso- tion submitted to the House of Delegates by r. H. H. Shoulders of Tennessee, prominent in e American legion of that state.

This resolution does not seem to be contrary any way to the avowed policy of the Ameri- an Medical Association in regard to the exten- on of free service, inasmuch as it must be as- umed that the veterans have already rendered to the government a service commensurate with any such disability policy.

The resolution submitted by Dr. Shoulders reads as follows:

"WHEREAS, The federal government has inaugurated the policy of rendering medical and hospital benefits to veterans of the World War with non-service connected disabilities; and

"WHEREAS, This policy was inaugurated over the opposition of the American Medical Association; and

"WHEREAS, The policy now in force if carried to its logical conclusions, involves the construction, the staffing, and the maintenance of a sufficient number of hospitals to accommodate the hospital needs of all the veterans of the World War; and

"WHEREAS, The present policy is of unequal benefit to veterans by reason of the fact that many disabled veterans cannot (for one reason or another) avail themselves of the benefit, therefore be it

"Resolved, That the House of Delegates of the American Medical Association petition the Congress of the United States and the American Legion to abandon the policy of rendering hospital and medical benefits to veterans of the World War with non-service connected disability, and substitute therefor a plan of disability insurance benefits with the following provisions:

"First, the creation of a Bureau of Disability insurance in the Veterans' Bureaus as now constituted.

"Second, the issuance of a disability insurance policy to each veteran with a disability benefit clause, as follows:

"(a) The payment of a weekly cash benefit during a period of total disability, and "(b) The payment of liberal hospital benefit sufficient to cover the hospital expenses of a veteran during a period of hospitalization for any disability. Such benefits to be paid to a veteran on satisfactory proof of total disability, and

"(c) Such other provisions as are necessary for the proper administration of the act.

"Be it further

"Resolved, That the proper officers of this association be instructed to approach the officers of the American Legion with the view to securing the adoption of the policy above set out as a part of the legislative program of the American Legion, and be it further

"Resolved, That each state medical association be requested to form a committee whose duty it will be to approach the state and local Legion posts throughout the country with a view to securing the adoption of this program by them."

This resolution was adopted by the House of Delegates following considerable discussion.

The American Medical Association is opposed to the policy of paternalism as applied to the care of veterans, but those of us who supported the Shoulders resolution do not believe that the insurance project as advocated by Shoulders is paternalism. It is a return by the government for a service rendered. The beneficiary is a free agent in expending this fund. Certainly this is not paternalism in the sense it might be if the government were to insist, also, on designating where the veteran should receive his medical service and from whom.

In view of the fact, therefore, that the present system establishes an out-and-out paternalism for a constantly growing class, that it is likely to undermine the morale of its beneficiaries and at the same time to cost the government untold millions for years to come, the Shoulders proposal seemed to a decided majority of the American Medical Association delegates very much the lesser of two evils.

Since the enactment of section 202(10) World War Veterans' Act which authorized treatment of all veterans in government hospitals without regard to their disabilities there has been an increase of 10,253 cases of this class within the last five years, according to an official veterans bureau statement, or approximately 2,000 per annum.

Col. George E. Ijams, director of the Veterans' Bureau, has officially remarked upon the unusual increase in medical activities of the bureau. During the first eleven months of the las fiscal year over 35,000 more out-patient treatments, 16,000 more hospital admissions and 750 000 more physical examinations had been recorded than during the previous year, he say He also points out that five new veterans' hosp tals have been completed and additional contrac hospitals have been made available.

SIX THOUSAND NEW BEDS IN FIVE YEARS, VETERANS' BUREAU OBJECTIVE

According to the official Veterans' Bureau estimate, 3,000 additional beds will be necessary i 1933, and 6,000 in 1936.

At the same time, civilian hospitals all ove the country are facing serious deficits, largel because there are empty beds in all of the amounting to approximately 40 per cent of th total capacity.

If these beds could be used by veterans, an paid for out of some such insurance policy as th Shoulders resolution suggests, the supporters c the resolution believe that present hospital def cits could be reduced, the government saved huge bill for additional hospitals and hospital a ministration and the cost of hospital care to th entire population lowered.

On the other hand, if the present policy of th federal government is pursued to its logical en such institutions for the care of all organic disease may very well be established as are foreshadowed in the cancer unit of the Edwar Hines Jr. Veterans' Hospital of Hines, Illinoi Note as evidence this interesting statement issued recently by the Hines hospital.

"It has been estimated," says the statemen "that among the veterans of the World Wa about 300,000 will die eventually of cancer, an that, in addition about 100,000 under favorabl circumstances will be cured, which means that i all probability about 400,000 veterans at one tim or another will suffer from cancer. Dr. Hug Scott, manager of the Edward Hines Jr. Hospital, estimates that probably 250,000 of these me will apply for treatment to one or another of th diagnostic clinics of hospitals. Thus the questio is very important and a start has already bee made towards its solution.

"In the central states, from Canada to the Gul of Mexico and from the Allegheny mountain to the Sierras, every veteran who is suspecte

having cancer will be sent to the Cancer Cen-
r which Dr. Scott has established at the Ed-
ard Hines hospital just out of Chicago."

Further evidence, not only of the magnitude
the present government program, but also of
e definite purpose of the government to rush
an early completion the gigantic veterans' hos-
tal building program authorized by the last
ongress is found in the following news item,
rrying a Washington date line and dated July
, distributed by a national press agency.

"Speeding up its work to provide employment
ring the depression, the veterans will complete
$20,500,000 hospital program a year and a half
ead of schedule, it was announced today.

"Under the policy of Congress of providing
spital facilities for non-service connected
ses, a policy which has brought complaint from
ganizations of American physicians, it is ex-
cted that other hospital programs will be au-
orized in the near future.

"Congress has appropriated $97,450,000 for
terans' hospitals since 1919, with the load of
tients increasing as the average age of World
ar veterans rises."

As indicated in the last paragraph, there will
a proportionate increase in the number of dis-
ilities originating in civilian pursuits as the av-
age age of the veterans rises, and it is this lat-
r type of cases that would require the con-
mplated increase in building programs.

It is obvious that the future policy of the gov-
nment in dealing with war veterans' relief is
the utmost importance to everybody. But it is
pecially important and serious to the members
the medical profession in view of the criti-
sm that has been directed toward the profes-
on in recent articles appearing in a number of
rvice men's magazines.

This criticism is prompted by misunderstand-
g of the physicians' attitude and a misconcep-
on of its aims and purposes relating to the vet-
ans' program.

"I believe," declared General Hines in discus-
ng veterans' legislation pending before the Senate finance committee of the last Congress, "that we have reached a point in connection with veterans' relief when we must give serious consideration to where we are going. It would be a pity, in my judgment, to have public opinion turned against relief measures for disabled veterans because of any unwise legislation for the able-bodied."

This, so far as it goes, is also the attitude of the medical profession.

THE THREAT TO EX-SOLDIER MORALE

But the physicians look farther than that. They see clearly the debilitating effect of a too beneficient paternalism on men who are otherwise quite fit to take a responsible, adult place in the world. They see these men taken from their homes, moved long distances for protracted stays in government hospitals, separated from their families and family responsibilities and gradually becoming the easy-going wards of the Veterans' Bureau.

At the same time they see equally well equipped and staffed civilian hospitals running at serious losses because of their thousands of empty beds—beds that could be occupied by these same men in their home towns, looked after by their family doctors. These empty beds are inevitably boosting the price of hospital care to the entire civilian population while the government continues to build hospitals and more hospitals to cope with its ever growing waiting lists of veterans.

From the very beginning the medical profession has taken an active interest in the veterans' relief program of the government. The seriousness of the question, the medical and hospital problems involved, naturally enlist the physicians' attention. That the tremendous stakes in government funds and in ex-soldier morale involved in the pursuance of the present scheme call for leadership in some new scheme of relief is the opinion not only of the physician but of many other conscientious, thoughtful people.

It may be that the Shoulders resolution will prove to be the answer to the problem.

THE SATURATION POINT*

N. O. Pearce, M.D.
Minneapolis

In the preparation of a paper, which had to do largely with the evolution of medical school teaching and its influence on modern medical practice, certain phases of economic influence bearing on the future practice of medicine came to light. Considering these to be matters of the utmost importance to the profession of the state, I have assembled a few pertinent facts which I am sure will point out the necessity for a carefully planned study of present conditions in the practice of medicine and show if possible how we may safeguard the future economic independence of the physicians of this state.

The practice of medicine, as a means of livelihood, is in many ways different from most other methods of earning a living. In a sense, the licensed physicians are what may be called a legislative monopoly. Collectively we are a great industry performing a definite task for which the people of the United States pay to us a certain aggregate sum of money yearly. The total sum has a definite limitation, which is probably basically fixed by the number of people in the country. This total medical income may be augmented by an increase in population, by a general increase in the prosperity of the country, possibly by new medical procedures, creating an efficiency in healing which would increase the demand for medical services, and further, by some plan that would assure physicians reasonable compensation for caring for those now receiving medical charity.

On the other hand, there are many influences at work which are materially deducting from the amount of medical service physicians are called upon to perform. For example,—many of the diseases which a few years ago occupied a large part of the activity of many physicians have been practically eliminated, and in the natural course of events, there will be other conditions which now form a lucrative part of medical industry which will also be eliminated. Furthermore, the education of people in health matters will eventually have a tremendous influence on cutting down the instance of disease. Also, the medically enlightened public of the future wi need much less medical consultation than in th past. So, it would seem that the influences th work today are those which will curtail rathe than enhance the earnings of the medical profe sion in the future.

Thus, a certain fixed sum of money, variousl estimated at from 450 to 600 million dollars re resents the combined annual earnings of the phy sicians of the United States. How this su shall be divided so as to give each individu physician an income somewhat commensura with his years of preparation, his capital inves ment, and long hours of daily industry and r sponsibility, is the fundamental problem whic confronts the practicing physicians individual and collectively of the United States today.

Obviously, if we take the medium sum of 50 millions of dollars annually, it would allow $10,000 income for 50,000 physicians. Ho ever, it is estimated that in this country there a at the present time two and a half times th many men actually practicing medicine for a liv lihood, which raises up the question of how ma physicians have we now in this country, and ho many do we need.

We have in this country today more physicia in comparison with population than any oth country in the world. Statistics show that in t United States there is one physician for eve 720 people. Austria comes next with 1—87 Switzerland, 1—1,250; Italy, 1—1,400; De mark, 1—1,430; England and Wales, 1—1,49 Germany, 1—1,560; France, 1—1,690; Belgiu 1—1,700; the Netherlands, 1—1,820; Swede 1—2,860; Mexico, 1—3,100; Brazil, 1—3,00 Persia, 1—25,000.

We had in the United States in 1930, 168,2 physicians—125,000 of whom were in acti practice, and 98,307 of whom were members the American Medical Association. It is some interest to note that only 62 per cent we members of our National Association, and th 73 per cent of all physicians in Minnesota we members of the State Association; while Henn pin County Medical Society has 62 per cen

---

*Address before the House of Delegates at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 4, 1931.

Ramsey 67 per cent, and St. Louis 75 per cent. t is of some importance to the organized medical rofession to know just who compose the 68,000 hysicians who are outside of our medical organzations.

There are at the present time undoubtedly a reat many more physicians in this country than re necessary to adequately serve the population, nd in the past few years there has been a arked increase in the number of physicians raduating from medical schools.

TABLE I

MEDICAL SCHOOLS AND STUDENTS

	United States		Minnesota	
ear	Schools	Graduates	Enrollment	Graduates
900	160	5214	368	53
905	160	5606	242	78
910	131	4440	177	31
915	96	3536	183	36
920	85	3047	340	55
925	80	3974	583	105
930	76	4565	740	133

ow in Medical Schools—21,597 700-1,000 yearly increase

Entered 1929-30—6,457 Applications—31,749

It will be noted (Table I) that while the med-cal schools have steadily decreased in number ince 1905, there has been a steady increase in raduates in the past ten years until, in 1929, eventy-six medical schools graduated 4,565 tudents. There are now in medical schools 1,597 students, more than at any other time in he history of the country, with an annual in-rease in enrollment of from 700 to 1,000. How-ver, a most significant and disturbing fact is that n the 1929-30 year there were 31,749 persons roperly prepared and qualified making applica-ion for entrance to medical schools, of which ,457 were admitted, and the rest refused only ecause of lack of facilities for educating them. We may very well wonder what will soon become f the practice of medicine as a means of liveli-ood if medical schools are encouraged or per-nitted to increase their capacity so as to accom-nodate all the applicants who would like to enter he profession.

Taking into consideration the number of phy-icians who are retiring and dying each year, here will have to be an approximate increase in he United States population of at least three nillion people per year in order that the ultimate ,500 yearly medical graduates of the United States will find a place in the medical field without raising our present ratio. As a matter of record, the increase in the population in the past ten years has been less than 1,700,000 per year. So figuring conservatively on the population basis, there will be twice as many physicians graduating as the normal population increase would support.

Bringing this problem to Minnesota, last year there were 130 graduates, and there were about forty deaths of physicians in Minnesota. Generally speaking, Minnesota will have to absorb the yearly contribution of her own medical school, and when we consider that there will be almost immediately at least 6,000 yearly graduates, and there are only 48 states, we will probably have to absorb at least 100 physicians per year, which on a reasonable basis of 1,000 population to the physician, would need a yearly increase in population in Minnesota of 100,000; while, as a matter of record, the population of Minnesota has only increased 176,000 in ten years.

TABLE II

UNIVERSITY OF MINNESOTA ENROLLMENT

Year	General Enrollment	Population Ratio	Law	Engineering	Pharmacy	Medicine	Dentistry
1900	2372	738	498	209	0	368	28
1905	2781	712	481	399	67	242	121
1910	3399	610	447	407	82	177	195
1915	3565	597	177	475	101	222	266
1920	7551	316	267	1213	117	385	400
1925	9858	251	285	1140	178	583	390
1930	12439	210	283	1601	152	740	272

University Increase, 425% Population Increase, 46%

This situation is probably to a large extent true in most other departments of professional education. The figures (Table II) show that in 1900 the University of Minnesota had one student to every 738 residents, while today there is one student to every 210 residents. The marked increase in the student body in the medical school is only equalled by that of the Engineering Department. The University student body, as a whole, has increased 425 per cent since 1900; while the population of the state has increased only 46 per cent. This situation in Minnesota is true also of the educational conditions throughout the country. There are today more people acquiring business, academic and professional education than the demands of the country can possibly afford to employ and unless some means are found to stem the flow of graduates from the professional schools, and especially medical schools, the doctor of the future will be hard-put to maintain economic respectability, and this is a real problem when we realize that the practicing profession no longer controls the institutions that are engaged in medical education.

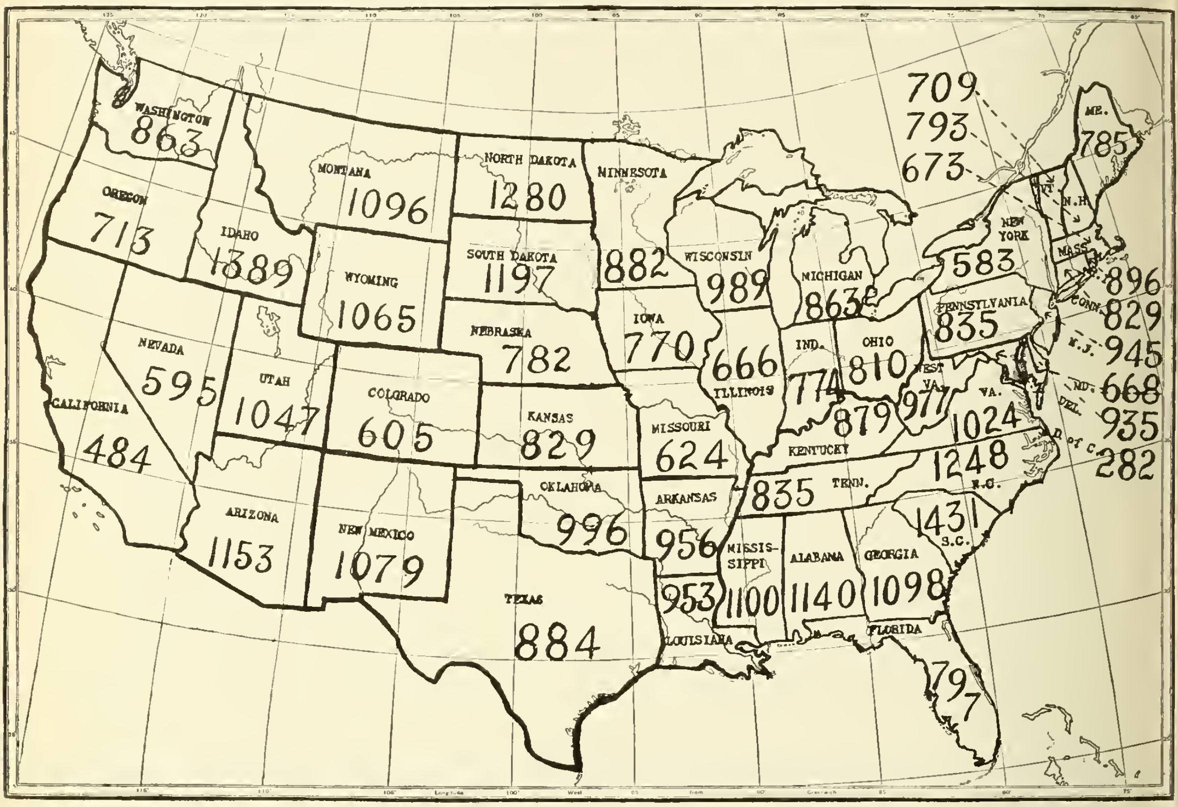

WASHINGTON
863
OREGON
713
CALIFORNIA
484
NEVADA
595
IDAHO
1389
MONTANA
1096
WYOMING
1065
UTAH
1047
ARIZONA
1153
COLORADO
605
NEW MEXICO
1079
NORTH DAKOTA
1280
SOUTH DAKOTA
1197
NEBRASKA
782
KANSAS
829
OKLAHOMA
996
TEXAS
884
MINNESOTA
882
IOWA
770
MISSOURI
624
ARKANSAS
956
LOUISIANA
953
WISCONSIN
989
ILLINOIS
666
MICHIGAN
863
IND.
774
OHIO
810
KENTUCKY
879
TENN.
835
MISSIS-
SIPPI
1100
ALABAMA
1140
GEORGIA
1098
FLORIDA
797
S.C.
1431
N.C.
1248
VA.
1024
WEST VA.
977
PENNSYLVANIA
835
NEW YORK
583
ME.
785
VT.
N.H.
MASS.
R.I.
CONN.
N.J.
MD.
DEL.
D. of C.
709
793
673
896
829
945
668
935
282

Fig. 1.

It was undoubtedly fundamentally a desire to curtail the number of physicians which prompted the American Medical Association in 1906 to undertake to raise the standards and requirements for medical examination and licensure. At that time we had 160 medical schools—more than all other countries together. Some states, as for instance Kentucky, had as many as 14. There were few schools in the country which would measure up to our present standards. In the process of evolution of the medical school to its present standards, great emphasis was placed upon pre-medic education and upon the importance of fundamental scientific branches in the medical schools. This necessitated tremendous monetary outlay in medical schools for laboratory and other facilities, and was the primary factor in eliminating a great many schools and causing the consolidation of a great many others. At present, only heavily endowed private schools and those associated with great state universities are able to exist.

In the process of financing the present medical schools, it has been necessary to place these schools under general university administration. So today, we no longer have medical schools in which the teaching and administration are in the hands of the practicing medical profession, but medical schools which are under general university administration with a full time teaching staff, who, as a rule, have never had much experience or any great interest in the private practice of medicine. The great emphasis on fundamental branches and research, and the small salaries available, have divorced, to a large extent, the interest of the practicing profession in medical teaching, and medical education is now in the hands of men who have come up, in most cases, through the laboratory and research departments, which tends to isolate the medical school from the practicing profession. However, I do not ropose to go into that at this time except to ay that I am not one of those who believe that nen with this background will not make excel-ent clinical teachers provided their research ctivities do not predominate in the school to ie detriment of students and teaching facilities. t any rate, this situation has taken away from ie practicing profession any great or command-g voice in the control of the size of these chools or of the number graduated except as e may have influence on legislative appropria-ons.

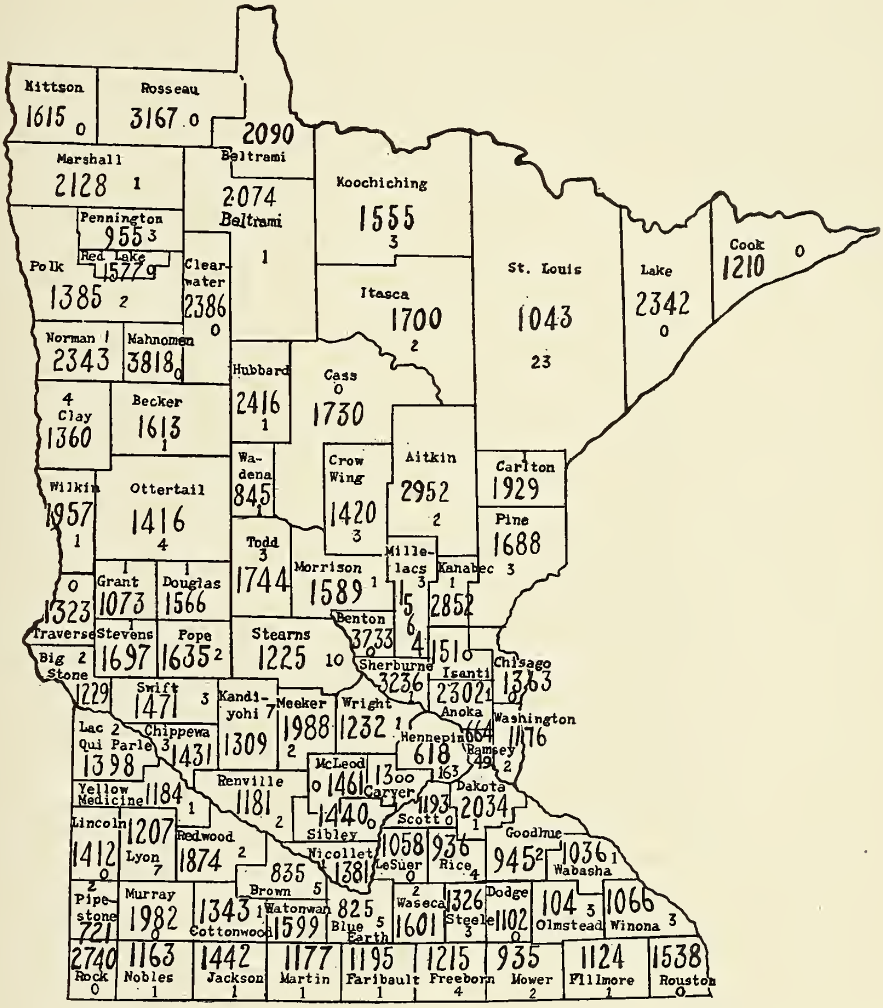

Kittson 1615 0
Rosseau 3167 0
2090 Beltrami
Marshall 2128 1
2074 Beltrami 1
Koochiching 1555 3
Pennington 955 3
Red Lake 1577 9
Polk 1385 2
Clear-water 2386 0
Itasca 1700 2
St. Louis 1043 23
Lake 2342 0
Cook 1210 0
Norman 1 2343
Mahnomen 3818 0
Hubbard 2416 1
Cass 0 1730
4 Clay 1360
Becker 1613 1
Wa-dena 845 1
Crow Wing 1420 3
Aitkin 2952 2
Carlton 1929
Pine 1688 3
Wilkin 1957 1
Ottertail 1416 4
Todd 3 1744
Morrison 1589 1
Mille-lacs 3 15 6
Kanabec 1 2852
0 1323 Traverse
Grant 1 1073
Douglas 1 1566
Stevens 1 1697
Pope 1635 2
Stearns 1225 10
Benton 3733 0 4
Sherburne 3236 1
1510 Isanti 2302 1
Chisago 1363
Big Stone 2 1229
Swift 1471 3
Kandi-yohi 7 1309
Meeker 1988 2
Wright 1232 1
Anoka 664
Washington 1176
Hennepin 618
Ramsey 149 2
163
Lac Qui Parle 2 1398
Chippewa 3 1431
McLeod 0 1461
1300 Carver
Yellow Medicine 1184 1
Renville 1181 2
Sibley 1440 0
Scott 0 1193
Dakota 2034 1
Lincoln 1412 0
Lyon 1207 7
Redwood 1874 2
Nicollet 1381
LeSuer 1058 0
Rice 936 4
Goodhue 945 2
Wabasha 1036 1
Brown 835 5
Pipe-stone 2 721
Murray 1982 0
Cottonwood 1343 1
Watonwan 1599
Blue Earth 825 5
Waseca 2 1601
Steele 1326 3
Dodge 1102 0
Olmstead 104 3
Winona 1066 3
Rock 2740 0
Nobles 1163 1
Jackson 1442 1
Martin 1177 1
Faribault 1195 1
Freeborn 1215 4
Mower 935 2
Fillmore 1124 1
Houston 1538 0

Fig. 2.

The second fact of interest which appeared in ie study was the marked irregularity in the dis-ibution of physicians as based upon popula-on. An attempt was made to study the distri-ution of specialists in different cities, but the data are not accurate enough to warrant drawing any conclusions, although it is very apparent that there is a wide difference in the ratio of specialists to population in different cities. However, the data on the ratio of physicians as a whole to population by states, by counties and cities, are available and show a most interesting variation.

An analysis of this condition will be well worth undertaking as it may lead to a better distribution in the future.

We have prepared a map (Figure 1) of the United States and the figures inserted show the ratio of physician to population. One is immediately impressed with the wide variation. For example, California has three times as many physicians per population as has South Carolina.

Why should Delaware have a ratio of 935 while adjoining Maryland has only 668? And why should New York have a ratio of two hundred less than any of the surrounding states? Why are there so few physicians in South Carolina and so many in Tennessee, and so many more in Missouri? Why have Nevada and Colorado only 600 people to each physician while Idaho has 1,389, Kansas 829, and Oklahoma 996? Why have Minnesota and Michigan only 882 and 863 respectively while Wisconsin has 989 and Iowa only 770?

We might reason that because Minnesota has two large population centers, St. Paul and Minneapolis, and Michigan a large population center at Detroit, that this would explain why we have a larger number of physicians than Wisconsin, which has no large population center. But this will not explain why Iowa, with no great population center, has still more physicians per population than any of these states.

The inequality of the distribution is even more striking when one comes to study the ratio of physicians to population by counties. For example, in Minnesota (Figure 2), the number of people to each physician ranges all the way from 3,818 in Mahnomen County, down to 618 in Henneipn County, not considering Olmsted, the home of the Mayo Clinic, where the ratio is only 1 to 104. It is probable that the use of county lines is not a very sound method of judging distribution. It is quite possible that doctors are concentrated in certain large towns or rural cities, but practice more or less in adjourning counties. However, this is not the entire explanation.

For instance, Anoka County, just to the north of Hennepin County, has a ratio of 1 to 2,302; and Wright County, just to the west, has only 1 to 1,232; and Meeker, still a little further away from Hennepin County, has 1 to 1,988. In other words, many of the counties in the best rural districts, some of which are very well populated, have a great many more people per physician than some of the poorest rural districts.

Likewise in the counties surrounding Olmsted County, with its great medical center, there are on the average more physicians for the population than in any other district in the state; while in the counties around Hennepin and Ramsey there are many less physicians than in many other parts of the state. Mankato, in Blue Earth County, has one of the lowest ratios of any city I know, but there is also a comparative concentration in counties adjoining. This state distribution will require a certain amount of explanation and analysis before conclusions can be drawn.

It is interesting to note the concentration of non-medical healers in the large cities and the rather even distribution throughout the rest of the state. The small letters represent the number of chiropractors in each county. They seem to bear no definite relation to the number of physicians in the various communities. Minneapolis is blessed with 163 chiropractors while St. Paul, with more than half the population, has only forty-nine.

A study of some forty-five cities with medical schools and forty-five cities of as nearly as possible equal population without medical schools, disclosed that the average ratio in medical school centers of population to physicians was about 100 less than in nonmedical school cities. However, there is a great variation in cities containing medical schools which is not entirely dependent upon schools or upon population.

For instance, in Washington, D. C., with a half million population, the ratio is 1 to 282; in Boston with three-quarters of a million people, the ratio is 1 to 332; St. Louis, with three-quarters of a million population, has a ratio of 1 to 426; Chicago, with three million, has a ratio of 1 to 511; Philadelphia, with two million, has a ratio of 1 to 541, and Cleveland, with one million, has a ratio of 1 to 645. So while the tendency is for the medical student to settle in the community where he has acquired his education, there are other factors involved in the distribution.

A further study was made of forty-five cities, fifteen with a population of over 300,000, fifteen between 100,000 and 300,000, and fifteen from 30,000 to 100,000. The selection presented on this chart (Table III) has a wide geographical distribution, and while the total number of cities actually canvassed were great in number, those presented are typical examples of the whole.

Of the large cities, we again have Boston with a ratio of 1 to 332; Kansas City with 1 to 391; Indianapolis, a city of almost identical size, with 1 to 485; Baltimore, more than twice as large, with 1 to 520; Minneapolis with 1 to 545; Milwaukee, with a hundred thousand more inhabi-

TABLE III

RATIO OF POPULATION TO PHYSICIANS IN 45 CITIES

Population 300,000 and over		Population 100,000 to 300,000		Population 30,000 to 100,000	
Washington, D. C.	282	Nashville	333	Oklahoma City	279
Boston	332	Denver	337	Lexington	302
San Francisco	358	Portland, Ore.	424	Lincoln, Neb.	379
Kansas City	391	New Haven	456	St. Joseph	408
St. Louis	426	Omaha	459	Columbia	418
New York City*	450	Richmond, Va.	461	Augusta, Ga.	420
Indianapolis	485	Hartford, Conn.	478	Fort Smith	452
Chicago*	511	Oakland, Calif.	485	Macon, Ga.	594
Baltimore	520	Salt Lake City	552	Wichita	616
Minneapolis	538	Fort Wayne	608	Kalamazoo	634
Philadelphia*	541	Akron, Ohio	685	Lancaster, Pa.	607
New Orleans	551	Tulsa, Okla.	720	Charleston	683
Seattle	595	Norfolk, Va.	742	Galveston	730
Milwaukee	643	El Paso, Texas	775	Ogden, Utah	751
Cleveland*	645	Duluth	834	Oshkosh, Wis.	772

*Over 1,000,000 population

tants, having 1 to 643; Cleveland, more than twice as large, with 1 to 645.

Coming to the second group (100,000 to 300,000), the range of the ratio is not strikingly different except that it tends to be considerably higher in many of these cities. Taking El Paso, Texas, for instance, with a population of about 117,000, with a ratio of 1 to 775. We find about the same range in cities of from 30,000 to 100,000—Oklahoma City with 1 to 279; Oshkosh, Wisconsin, with 1 to 772. Why Nashville, Oklahoma City, Denver, Lexington and Lincoln, Nebraska, should have such a low ratio, and why Tulsa, Charleston, Norfolk and Galveston, should have such a high ratio, are questions presenting problems which are worthy of some investigation.

A further study (Table IV) of the situation in Minnesota in particular, with reference to some of the larger and smaller cities, and a comparative study of the ratio between city and rural physicians in Minnesota, gives one much interesting information. I was considerably surprised to find that of all the larger cities in the country, Minneapolis, while far from being the best, is just as far from being the worst. In spite of the steady influx of physicians to Minneapolis, the ratio of physicians to population has not materially changed in the past twenty years.

You will note a ratio of 1 to 538 in 1912, and a ratio of 1 to 548 in 1929. St. Paul has not been quite so fortunate. In 1912 their ratio of 1 to 709 was much greater than that of Minneapolis. It is now down to 1 to 636, but still almost a hundred more people per physician than Minneapolis. Duluth with the exceedingly high ratio of 1 to 808 in 1912 has come down to 1 to 725 at the present time. There are almost 200 more people to each physician in Duluth than in Minneapolis. Just why this situation should prevail is not entirely clear. Here again is a point for study which should bring some information of material value.

TABLE IV

RATIO OF PHYSICIANS TO POPULATION IN 1912 AND 1929

		1912			1929	
	Population	Physicians	Ratio	Population	Physicians	Ratio
Minneapolis	301,408	560	538	464,356	847	548
St. Paul	214,744	303	709	271,606	442	636
Duluth	78,446	97	808	101,463	140	725
Rochester	7,844	55	143	20,621	397	52
St. Cloud	10,600	13	815	21,000	33	636
Mankato	10,365	28	370	14,038	36	390
Winona	18,583	21	885	20,850	22	948
Four Cities	602,462	1,015	593	858,046	1,826	475
Rural	1,473,246	1,247	1,181	1,705,907	1,258	1,355
Total	2,075,708	2,267	911	2,563,953	3,084	882

A cursory study of three of our largest cities outside of the four shown above, shows a wide difference of population to physician. It will be noted that in 1912 St. Cloud had a ratio of 1 to 815. In spite of a large increase in population in the past seventeen years, the ratio is now down to that of St. Paul, and much lower than that of Duluth. Mankato, for some reason unknown to me, had in 1912 a ratio of 1 to 370, and with a moderate increase in population of 4,000 in seventeen years, has still maintained about the same ratio which is now 1 to 390, one of the lowest, if not the lowest in the state for a city of anywhere near its population. On the other hand, Winona, a city situated in the very best of Minnesota's farming country, and with an old wealthy population, had a ratio in 1912 of 1 to 885, and with a modest increase of 2,000 there has been only an increase of one physician, and the Winona doctor is now in the rather unique position of being only one physician to 948 people.

A composite study of the four principal medical centers shows that in Duluth, St. Paul, Minneapolis, and Rochester in 1912, there were 1,015 physicians and a ratio of 1 to 593, while in all the rest of Minnesota there were 1,247 physicians with a ratio of 1 to 1,181. Now in 1929, the population of the cities has increased 256,000, while the number of physicians has increased 810, reducing the ratio for these four centers to 1 to 475. The influence of Rochester here is obvious. But what is more interesting and significant is that the rural population increased practically the same amount while the physicians have only increased a few more than one hundred, and the ratio of rural physicians to population has risen to 1 to 1,355. In other words, of approximately 800 physicians who have come into Minnesota since 1912, 700 have settled in the cities and only 100 outside of these cities, while the population increase in rural Minnesota is almost as large as the population increase in the four cities. This is of especial interest when we consider that the amount of work referred from country districts to the Twin Cities is estimated to have dropped from 33 to 50 per cent in the last ten years.

The income of physicians in the cities is also greatly influenced by the large number of nonmedical healers and by the many free clinics. It is estimated that in a city the size of Minneapolis, 25 per cent of all medical service is rendered by the physician without pay.

We have so far discussed the number of physicians in relation to the population and the distribution of physicians. These things are of importance mostly as to their direct bearing on the physicians' income.

Any attempt to study the earnings of physicians is fraught with much difficulty. No single study that I know of has ever been complete enough to warrant drawing any sound conclusions. Not long ago, an article in our daily papers quoting Dr. Palmer Johnson of the University stated "that the income, over the past thirty years, of university graduates who received degrees, ranged from $1,722 to $7,791, and that the physicians were at the top of the list." This statement was misleading because I believe it only referred to physicians on salary, but in any event, as you will remember, there are 168,000 physicians in the United States, and this study and the results are based on the replies to the questionnaires of only 400 physicians.

A questionnaire study in 1929 of the West Virginia State Medical Association, which is said to have been answered by a majority of the members, showed an average gross income of $9,580.60 with a net income of $6,414.43, the largest net income being $28,000, and the smallest $420. This is a state with a ratio of 971 people to each physician.

A questionnaire prepared about the same time by the Hennepin County Medical Society, which was answered by 169 out of 550 members, gave an average income of $10,300, with an average expense of $3,400, and a net income of $6,900. The figures of these studies vary so much with the figures derived from the study of the estimated total medical income, that one is forced to conclude that physicians of from medium to small earnings do not, as a rule, answer these questionnaires, and that with the comparatively small number replying, a few of the largest incomes have undue influence in raising the general average. In the past two or three years, estimates have been published of the total medical income for the United States. These estimates have varied from $600,000,000 per year by a report, the source of which is unknown to me at this time, to one two years ago of 500 million by the Metropolitan Life Insurance Company, and one, the most recent, as given out by Mr. Paul Benjamin, secretary of the Committee of Fifty, of 450 million dollars. Now then, let's take 500 million as a medium figure. Dividing that sum by the 125 thousand practicing physicians gives us $4,000 as the average gross medical income. With an average overhead of 30 per cent, this would leave an average net income of $2,800 (Table V).

Table V

PHYSICIANS' EARNINGS IN RELATION TO COSTS OF SICKNESS PER YEAR IN UNITED STATES

Patent Medicines and Drugs	$700,000,000
Physicians	500,000,000
Hospitals (civil)	380,000,000
Nurses (all forms)	200,000,000
Dentists	150,000,000
Non-Medical Practitioners	50,000,000

125,000 physicians dividing $500,000,000 = $4,000 each
Average overhead 30% Net average income $2,800
Allowing 30 day vacation Employed 335 days
$2,800 for 335 days = $8.35 per day

Should we allow a thirty day vacation period, a physician would have 335 working days. This would give an average daily net income of $8.35. Just where the medium income of physicians should be placed is hard to decide. It is probably considerably higher than the figure represented here, but undoubtedly a great deal lower than would be indicated by some of the studies already mentioned.

It is interesting to notice the 700 million spent for patent medicines and drugs, the tremendous amount being paid in hospital bills, the enormous amount now being paid to nurses, the comparatively smaller sum to dentists, and the 50 million dollars that goes to the non-medical practitioner.

Table VI

MINNESOTA NON-MEDICAL PRACTITIONERS

	Chiropractors	Osteopaths	Midwives	Masseurs
1928	493	162	111	268
1929	486	160	101	214
1930	462	165	95	200
1931	451	162		
Minneapolis	161	49	21	39
St. Paul	49	22	22	89

There has been apparently a tendency for chiropractors to leave the state (Table VI). We still have the same number of osteopaths as we had four years ago. We have not investigated records previous to the time of the Basic Science Board, but it is quite evident that the heroic efforts of our legislative committee in passing the basic science law has put an effective stop to the influx of nonmedical healers in Minnesota. And, if we will back up our legislative committee in its efforts to prevent legislation which will break down this defense, we can look forward to the time when there will be few osteopaths and fewer chiropractors in Minnesota and the other still worse types of healers will be entirely eliminated.

There are a great many influences which are now at work which have a direct bearing on medical income. Some of these are new and hard to evaluate.

Table VII

INCREASE IN MEDICAL AND NURSING PROFESSIONS IN UNITED STATES

	Physicians	Nurses
1900	122,167	11,804
1910	135,317	82,327
1920	145,608	149,128
1930	168,201	214,751
	Graduated	
1930	4,565	18,000

In 1900 (Table VII) there were 122,167 physicians and 11,804 trained nurses in the United States. The increase in physicians was 13,000 in the first ten year period, 10,000 in the second ten year period, and 23,000 in the last ten year period. On the other hand, the nurses increased 71,000 in the first ten year period, 67,000 more in the next ten year period, and 65,000 in the last ten year period, until today, with 168,000 physicians, we now have 214,751 graduate nurses. In other words, there were four graduate nurses in 1930 to each graduate physician.

Dr. Olin West said recently that "we have gradually succeeded in raising the standards of nurses' education until they are now 'pretty good doctors.' " We realize, of course, that many thousands of these nurses are not actively engaged in the nursing profession. However, many of them have gone into public health fields and are doing work which is very nearly medical, and in not too few instances, directly in competition with physicians. The trained nurse is potentially a source of fairly sound, cheap, medical information. It cannot be assumed that because many of these women are no longer practicing their profession that they are not still a very prolific source of free medical advice. How many thousands of sick people are saved the expense of a physician's service by the free advice of the public health nurse, the school nurse, the insurance nurse, or by the sister or neighbor upstairs who is a trained nurse, cannot be estimated. But this huge number of medically trained people creates a problem never before met in history and is worthy of profound consideration on the part of the medical profession.

The influence of free clinics on medical earnings presents another problem which is mostly of importance because of the rapid growth of this sort of free medical service, which, in most instances, is not promoted or controlled by the medical profession. The chart shows that we had 600 free clinics in 1910, and it is estimated that there are now 6,000. A study made in New York City, with a population of six million people, showed that 1,250,000 people visited free clinics, making the total visits 6,000,000. If this group of people had been compelled to make some provision for medical care, even the small amount of $1.00 for the year, it would have augmented the income of physicians in this area by one million and a quarter dollars.

The interest of the lay public in medical matters has been greatly enhanced in the past few years. Seldom do you pick up a newspaper that does not contain from one to four, or more articles, pertaining to some phase of medical practice. The great amount of time lost due to sickness and injury has aroused the interest of industry.

The company physician is becoming an integral part of the personnel of a great many industrial organizations. This may be the first step toward the encroachment of business organizations in the field of medicine. It is estimated that 42 million people are gainfully employed in the United States. Each employee loses on an average of eight days a year as a result of sickness or accident. This results in a loss of 350 million working days, which, with the death annually of 500,000 workers, results in an estimated annual loss of $1,800,000,000. The estimate of $1,000,000,000 of this which could be saved to industry by proper medical advice and care, to me is grossly excessive. We are given credit for altogether too great an ability in the preventive field, which may eventually be to our own undoing. Certainly mediocre work and the care of the injured will not be long tolerated by either the employer or the insurance company.

There is much to be said about the corporation practice of medicine and undoubtedly the cost of illness could be greatly reduced by better organization of medical practice. Our present scheme of caring for the sick is to the people ruinously expensive. The physicians are directly responsible for making many medical paupers.

Our 7,000 hospitals, with an investment of three billions of dollars, are only exceeded in industry by iron and steel, textiles and their products, chemicals and allied products, and food and kindred products. There were only 2,070 hospitals in 1900. This number has increased 200 per year since that time. In 1909, the estimated bed capacity was 421,065. In 1928 the bed capacity had reached 892,924, and today is well over a million.

Too many physicians naturally raise the cost of medical care. Unnecessary medical procedures and unnecessary visits are a natural result of scrambling to make a living. Undue competition tends to unnecessary and over-elaborate office equipment, and a small number of patients does not allow an adequate spread of overhead.

Studies of 150 medical clinics in this country, most of which are in the middle west, tend to show no increased cost to the patient and a decidedly increased income to the physicians in these clinics. The cost of care of the sick by the government, while in many ways extravagant, is very much less than could possibly be made to pay by the private physician. One of our great local institutions is able to give adequate daily care for 600 sick and convalescing patients at a medical expense of $55 per year per patient. Unless the medical profession can organize itself so as to eventually decrease the cost of medical care, there is no doubt but that there will be a great increase in the number of individuals accepting medical charity, or lay organizations will come into the field with proper organization and provide medical service at a very much lower cost than that which prevails today with very considerable profit to themselves.

Just one more step and we will have institutions established and thoroughly equipped and operated by lay people, managed by lay people, for profit, with doctors on a salary basis.

Perhaps the most eminent and important influence working into the practice of medicine at this time is that represented by health, injury and compensation insurance.

Most of the states have at this time some form of compulsory accident compensation insurance, but none so far has developed a compulsory sickness insurance. It is not necessary in this paper to discuss the different plans of compensation surance except to say that the plan varies reatly in different states. The important point physicians is that it assures them a fairly dequate fee for the care of the injured. In 930, there was paid to physicians in Minnesota 2,100,000 by insurance companies, and this represents 37 per cent of the entire disbursement this state under this act. In this type of inrance the compensation feature outweighs the st of medical and hospital care. So, insurce companies are interested in getting the best ssible surgical service and the tendency is to y reasonably well.

Our legislative committee have fought and won strenuous battle in this present legislature to aintain the right of the patient to select his own ysician. However, the insurance companies ill not tolerate incompetence or neglect in the re of the injured, and it is only a matter of me when they will hire their own physicians a stated salary to do this work in the large nters at a much reduced cost to themselves. oluntary health insurance is rapidly on the inease in this country. In 1926, there were 0,000 such policies, and in 1930, 2,000,000 alth and accident policies covering 85 per cent medical, hospital and nursing expense. While is is a move in the right diretcion, it is unfortuate from our standpoint that the people who are rrying this insurance are not the ones who are dinarily objects of medical charity. Undoubtlly, in the near future, some form of compulry health insurance will be enacted, and we ust be well prepared, indeed, if we are to have y commanding voice in the drafting and enactg of such legislation. This is a world-wide ovement, and if it will in some way provide a eans by which the poorer classes are compelled insure themselves against becoming objects of arity, medical and otherwise, when they are ill injured, it will undoubtedly be of great value.

However, in every scheme of health insurance w in existence, the compensation to physicians r service rendered is pitifully small as comared with what we now receive, and in most untries compulsory health insurance is not mited to the poorest classes but includes many ho are well able to pay adequately for medical rvice.

You will note (Table VIII) that Germany was e first country to establish this plan of insurnce and it goes back to 1883, while France is the last one, starting their scheme in 1929. The League of Nations in its International Labor Bureau Report of 1927 approved and recommended that all countries adopt some plan of compulsory health insurance. Mr. Paul Benjamin, secretary of the committee of fifty, when here, stated unofficially that he thought that some plan of insurance would be recommended in the report of this committee as a means of lessening the burden of the present medical cost. Dr. West said, in regard to the same committee, "I can venture no prediction, I can only promise you that if I can prevent it, no socialistic schemes will be advocated, but I am, of course, only one of a committee of fifty to sixty members."

TABLE VIII

COMPULSORY HEALTH INSURANCE

Germany	1883
Hungary	1891
Norway	1909
Great Britain	1911
Bulgaria	1918
Portugal	1919
Poland	1920
Japan	1923
Chile	1924
France	1929

Today more than half of the German population is participating in health insurance schemes. Of the physicians in Germany, 80 per cent are deriving all or part of their income from panel patients; 15 per cent are salaried physicians; and only 5 per cent of the German physicians are practicing independently. The ratio established in Germany by the insurance companies indicates that there should be one physician to every 1,350 people.

It is most interesting to note that with 40,000 physicians working in the German panel, there are 27,000 civilians in the administration department, and, incidentally, the large incomes are in this group only. The ridiculously small earnings of the physicians of this system is illustrated by the fact that the care of a patient for one month in Danzig is less than the price of a hair cut and massage.

In England the situation is somewhat better. Only the workers, and not their dependents, are permitted to participate in the panel, and only those services which could be considered as work of general practice are included in the regular fee. All major operations and work of specialists must be paid for, or is paid for, by a special additional fee. They consider from 900 to 1,500 people an adequate group for a panel physician, the patient in all cases having a right of selection. The amount of $2.25 per year is paid to the physician for all persons who register with him regardless of whether or not they are in need of medical service.

These insurance schemes are great levelers. They insure the younger and less successful man at least a reasonable amount of work although the compensation is comparatively small.

I would like to further discuss the details of the operation of these schemes for medical care, but time does not permit. We must assuredly be prepared for the proposal of some such scheme in this country. In most other countries, no matter on what high ideal the scheme was originally established, it has sooner or later become a political football and the medical profession has been hard-put to remain to any degree in control of their own activities.

In closing, let me sum up in a few words:

We have already more physicians in this country than are necessary to adequately and econon ically care for the sick.

Our medical schools are rapidly increasing tl annual output of physicians.

The present distribution of physicians is poor systematized and tends to undue concentration

Too many physicians raise rather than lowe the cost of medical care.

Just ordinary common sense and busine acumen would prompt any great industry to car fully survey the market for its product, and hol production down to a point when supply will n exceed the demand so that it can be assured c a ready market at a reasonable return for th output. This is what we should do today.

The medical profession, as well organized as is in Minnesota today, can and should undertak a careful and detailed study and analysis of th situation of the medical profession in this stat and, through its splendid organization, shoul take such steps as are necessary to protect th future practice of medicine as a means of livel hood.

THE FEDERAL FOOD AND DRUGS ACT

1906-1931

A quarter of a century ago, on June 30, 1906, President Theodore Roosevelt signed the Food and Drugs Act specifically designated "for preventing the manufacture, sale, or transportation of adulterated or misbranded or deleterious foods, drugs, medicines and liquors and for regulating traffic therein, and for other purposes." This measure has had a wholesome effect that can scarcely be realized by those not familiar with the conditions of the past. The American Medical Association, through the Council on Pharmacy and Chemistry, has been a pioneer in its efforts to protect the medical profession and the public against fraud, undesirable secrecy and objectionable advertising in connection with proprietary medicinal articles. Its efforts have been greatly facilitated by the passage an enforcement of the Food and Drugs Act. The comin of age of the Food and Drugs Act should not be a lowed to pass without some reference to the dominar figure in the crusade for pure foods and drugs, th late Dr. Harvey Washington Wiley. He was chic chemist of the U. S. Department of Agriculture durin the period of the fight for the federal act, and unt 1912, "a very mountain amoung men, a lion amon fighters." The movement that he helped to start deserves unqualified commendation. The forces on th fighting line deserve congratulation. There is still muc to be accomplished. Vigilance must never be relaxe (Jour. A. M. A., July 4, 1931, p. 32.)

PARESIS AND MALARIA[*]

George N. Ruhberg, M.D.
Saint Paul

INCE 1917 the results obtained in the treatment of paresis have not only shown a ssened mortality, but have returned an in- easing number of patients to economic re- very. This is encouraging when compared with sults formerly obtained. Von Jauregg's work introducing malaria for the treatment of this sease has not only given us a most valuable ethod of treatment, but has stimulated work in e treatment of syphilis by non-specific means, hich in time may produce something more valu- le than malaria itself.

In the majority of cases the spinal fluid is tered by reduction of cells; by diminution in tal protein; often by reduction in the strength the Wassermann reaction, and a modification reduction in the colloidal gold curve. Clinical- the results are at times startling, at other nes disappointing, but on the whole the remis- ons have been more lasting, the mortality less, d the incidence of economic recovery mark- lly increased. The usual reported clinical re- veries from different studies by recognized thorities have ranged from 25 to 50 per cent. must be remembered that these cases are prac- cally all advanced to the degree of requiring spital care, showing unmistakable mental mptoms and are economically totally incapac- ated.

Pathologically paresis is characterized by ickening of the dura and pia arachnoid; a attening and atrophy of the convolutions, es- ecially of the frontal and parietal lobes, with me thinning of the cortex and loss in brain eight. There is increased vascularization of the rtex, and perivascular infiltration with round, lasma and mast cells. There is also a generalized roliferative glial reaction, and the nerve cells ow all stages of degeneration. Inflammatory actions are also found around groups of spiro- etes within the substance of the brain. Areas f softening are also found secondary to peri- d endarteritic changes. There is considerable isorganization of the cortical layers and disap- earance of the tangential and association fibers. Degenerative changes may also occur in the basal ganglia, brain stem, and in the cerebellum. Jacob has pointed out that in paresis the tissue fails to react with sufficient strength against the spirochete and thus fails to produce the typical gumma, or characteristic granuloma. The miliary gummata occasionally found are considered by him to be specific and successful reactions against the infection. When this infection is severe, or the reaction weak, the process becomes malignant, and is represented by the non-specific diffuse reaction of paresis.

Spielmeyer has emphasized the important conception of two fundamental types of lesions found; the vascular (mesodermic) and parenchymatous (ectodermic). He has also emphasized the independence of these two types, and the importance of considering them separately in studying and comparing the pathological and clinical findings after treatment with malaria.

Just how malaria acts on the paretic brain has not been definitely settled. Freeman reported that during the early stages of treatment the inflammatory reaction appears to be exaggerated. He also believes that there is organization of the perivascular exudate, and finally a reconstruction of the cortical laminations. Many authorities have denied an exacerbation of the process, as well as the existence of a "healing inflammation." Straüsler and Koskinas described the regression of the pathologic process and a stationary appearance of the lesions, comparable to the picture of stationary paresis described by Alzheimer. They interpreted their findings as due to the non-specific and malignant forms of the paretic reactions undergoing a change into a more benign form. Kirschbaum thought that the malaria acts by simple reduction and moderation of the inflammatory exudate. Ferrarro from a study of twenty-nine paretic brains concluded that the beneficial influence of malaria was chiefly exhibited in its effect on the inflammatory reaction. This change consisted in diminution of the exudate, and in the reduction of the new blood vessels. Its influence on the parenchymatous changes are less definite, but in favorable cases the beneficial influence is evident on both ectodermic and mesodermic reactions. He found no parellelism between the clinical course and the vascular reactions, but he did find a rough parallelism between the clinical course and the a subsidence of some of the parenchymal reactions.

---

[*] Thesis presented before the Minnesota Academy of Medi- ne, February 11, 1931.

In considering the subject of paresis it is necessary to consider the sequence of events following the intial infection. Brown and Pearce have shown experimentally that within a few days spirochetes may be secured from the heart, blood and lymph glands of rabbits. Dissemination of the organism probably takes place from the lymphatic system to the peripheral blood stream. From the blood stream they seek more favorable surroundings and after a second period of incubation in their new locations the tissues react with the secondary outbreak. At this time the immune reaction takes place. With the regression of the secondary lesions, the vast majority of organisms are killed by this natural defense. This immunity may prevent the organisms harbored in the lymph glands from being thrown off, or it may destroy those that later escape from these foci. The duration of this process varies from three to twelve months, and from then on the disease is latent. The *Treponema pallidum* probably is not neurotrophic, but involves the central nervous system by vascular routes as a consequence of the general infection. The spirochete has been demonstrated in the spinal fluid with otherwise normal spinal fluid findings. The same phenomenon has been demonstrated in rabbits. The reason for the incidence of neurosyphilis probably is accounted for by the nature of the soil on which infection takes place. Brown and Pearce have suggested that all tissues are not equally protected by the general reaction which occurs during the early stages of a syphilitic infection, and that certain tissues, which fail to receive this protection, may be capable of only a slight degree of self-protection. They believe that this holds true for reactions in experimental animals, and that this local immunity, or lack of it, may explain the incidence of neurosyphilis in man.

Filder, Maitland and Parnell in a study of 1,314 cases of early syphilis found a pleocytosis in the spinal fluid in 14 per cent during the primary stage, in 21 per cent during the late primary, and in 30 per cent up to eighteen months following infection. The spinal fluid Wassermann reaction was positive in 3 per cent of the late primary cases, and in 6 per cent up to eighteen months. Fordyce and Moore also found in their series that the time of involvement of the central nervous system reached its maximum by eighteen months following the initial infection From then on the disease is latent, and is known as latent, or asymptomatic neurosyphilis. In some cases the disease may never again become clinically active. However, should such a patien die at any time, a thorough microscopic examination will reveal the presence of small latent lesions which vary greatly in degree and extent Warthin has stated that in no case of latent neurosyphilis has he found an absolutely inactive syphilitic infection. In nearly 100 per cent of these cases he found focal lesions in the meninges. There is apparently a slow progressive development of spirochete localization, with healing and fibrosis. They are found most frequently over the parietal, temporal and frontal lobes According to Warthin they vary greatly in size and show every degree of transition between mild fibrosis to clinically active and more extensive involvement of the meninges. In the brain he found small localized areas of perivascular infiltration, similar to those found in the lesions in cases of paresis and cerebral syphilis. They are usually few in number, and very small in size, and they are found most frequently in the neighborhood of the frontal and parietal lobes, and especially in the neighborhood of the ventricles. The important consideration in latent, or asymptomatic neurosyphilis, is that active, progressive, pathological changes are present in the central nervous system as a consequence of syphilitic infection.

It is readily evident that the only means of diagnosing latent, or asymptomatic neurosyphilis, is by examination of the spinal fluid. For this reason no patient should be discharged from treatment of acute syphilis without such an examination. The ideal situation would consist of spinal fluid examination during treatment, and within a reasonable period up to five years following. The presence of an early positive fluid is a serious thing, and the failure of the profession at large to recognize this fact constitutes, in my opinion, one of the major reasons for the prevalence of clinical neurosyphilis. As a rule, the more marked the fluid changes, the longer it takes to reduce it to normal. Also the more marked the fluid changes, the more serious is it to the patient. Usually the ordinary methods of treatment are sufficient for minimal and intermediate changes. However, the treatment should be guided by fluid findings, and many cases will require more intensive treatment than others.

In this consideration it is interesting to note Moore's findings in insufficiently treated cases of latent neurosyphilis. He found that inadequate treatment caused an increase in the group showing the paretic formula. This may explain the earlier onset and, according to Nonne, the increase of paresis following the introduction of salvarsan. It is with this group of cases showing the paretic formula, a four plus Wassermann a paretic gold curve, increased cells and globulin, that we are particularly interested in this discussion. I know of no large group of cases of latent syphilis of this type which has been adequately studied. It is essential that titered Wassermann reactions be done; that colloidal gold, or similar reactions, be used to bring out the paretic curve, and definitely separate this group from ordinary asymptomatic neursosyphilis. I am unaware from a search of the literature of such a study having been done in a large group of cases extending over a period of a decade. When we consider that paresis usually exhibits itself clinically fifteen to twenty years after infection, the need for further investigation of the fate of these individuals showing the paretic formula is realized. In a series of thirty-six such patients under Moore's observation for only eight years, only 27 per cent can be regarded as clinically and serologically well; thirty-three per cent have developed clinical neurosyphilis, and in 40 per cent the status is questionable; seven have developed paresis, and three tabes. It was found that the usual methods of treatment were of no avail, and those that did show a satisfactory fluid reduction took on the average forty months' intensive treatment, and in many malaria and tryparsamide were needed. This excellent but unfinished study by Moore of a small group of these cases, over a comparatively short time, gives an indication, at least, of the serious prognosis and grave danger of subsequent ruination by parenchymatous neurosyphilis.

The early asymptomatic cases are in the hands of the syphilographers and general profession. The majority still go unrecognized as such. The neurologist, as a rule, does not see them until many years later, when clinical signs are evident, and in many the destruction has progressed to such an extent that cure, or even alleviation, is frequently impossible. If results are to be improved, these cases must be diagnosed and treated earlier than at present. It is essential that not only clinical results be obtained, but that the serology be reduced to normal if possible.

Just when paresis begins is extremely hard to determine. Theoretically speaking, the preparetic stage extends from the time of initial infection until the frank appearance of paresis. The first stage is asymptomatic or latent; the second stage has been described by Jellife as neurasthenic. During this stage neurasthenic symptoms appear with very fine gradations of personality and conduct changes. The correct diagnosis of this stage is paresis sine paresii. After a variable period of time the mental symptoms make their appearance, and it is in this period, usually fifteen to twenty years after the initial infection, that the diagnosis is made and serious treatment begun.

The treatment of paresis may be said to be an attempt to prevent as much as possible parenchymatous destruction in the brain. Logically to do this most successfully the attempt must be made before destruction has markedly progressed. In other words, we must recognize the potential case and treat it accordingly. Because I believe that malaria is, at present, the most effective method in treating paresis, I advocate its use in all suitable cases of neurosyphilis showing a paretic formula which fails to reduce after a reasonable trial with the usual methods. The following cases are illustrative:

CASE REPORTS

Case 1.—A male, aged 43, married, was first seen in May, 1925. He had had a chancre twenty years previous. He had the usual secondaries, and received inadequate treatment. In 1922 he noticed his left hand closed on him occasionally while working. In August, 1923, he suddenly became unconscious. On coming to, he was drowsy and his left arm was paralyzed. He recovered the use of his arm and hand in a few days, and since then has had no recurrence of these spells. He stated, however, that when he got nervous he lost some control of the left hand, and it would shake. He suffered frequently from headaches during the last two or three years. He had no girdle or lightning pains, and had no trouble in handling the legs. In 1925 he made an application for and was refused life insurance. He then consulted the late Dr. Sweeney and myself on May 6, 1925.

On examination his pupils did not react to light. The right was larger than the left. Test words were well enunciated. The strength in the right and left upper extremities was equal. The abdominal and cremasteric reflexes were present. The right knee jerk was one plus; the left three plus. Achilles reflexes were both present. There was no clonus or Babinski; the coordination was good, and the fundi were normal. Spinal fluid examination showed cells 45; gold sol. 4423120000; Wassermann 4 plus; globulin positive; blood Wassermann 4 plus. He received active and continuous treatment until December 12, 1927, when the spinal fluid showed cells 18; Nonne ++; Wassermann ++; mastic +; gold sol. 5555540000; blood Wassermann negative. His subjective symptoms in the meantime had cleared up, and he felt well. He was discouraged about the results from two and a half years continuous treatment, for although some improvement was obtained in reducing somewhat the strong Wassermann reaction, yet the gold curve was unmistakably stronger in the paretic zone, and the fluid on the whole showed the paretic reaction.

In January, 1928, he was inoculated with malaria. He had ten paroxysms, during which his temperature varied from 103 to 106. He made an uneventful recovery, and returned to work in April, 1928. His health improved, he gained ten pounds in weight, and he stated eight months after the malaria that his health was better than it had been in years. On September 2, 1929, spinal fluid cells were 2; Wassermann negative; globulin a trace; gold sol. negative; blood Wassermann negative. In September, 1930, the fluid continued negative, and he is in good health.

At no time could this man have been diagnosed as a clinical case of paresis. Dr. Sweeney and I thought he was a potential case, and that there was grave danger of his later developing paresis. For this reason, when prolonged treatment of tryparsamide and arsphenamine failed to reduce the fluid to normal, he was given malaria. It accomplished the desired results, and so far, at least, he seems to be out of danger. With a negative fluid, his chances of escaping this fate are probably much improved.

Case 2.—A single man, aged 43, admited a gonorrheal infection fifteen years previously. For the past two years, he had had several spells during which he developed a weakness of the left arm and leg. He also said his head felt "wooden" at times, and he said he noticed that his memory was rather poor, and he would have trouble in concentrating on his work. He was rather apprehensive during these spells, which would last for a few days, and at one time he had the fear that he was going to lose his mind. He consulted his doctor, who made a diagnosis of neurosyphilis, and gave him treatment with arsphenamine and bismuth for a year and a half. He was referred to me for examination in September, 1929. The pupils reacted sluggishly to light. There was an internal strabismus of the left eye. His speech was normal. There was a slight tremor of both hands. The right optic disc was somewhat pale. Spinal fluid showed Wassermann 3 plus; gold sol. 555543000; globulin one plus; cells 18.

His mental reactions seemed slightly sluggish to me, but he showed no memory defects to recent or past events, nor any malignant mental signs. He was somewhat apprehensive about losing his mind, and he stated that mental work was harder for him. Treatment with malaria was advised. This was given in November, 1929, and he had five severe chills, accompanied by marked prostration. His blood pressure went from 130 to 90, and the treatment was then terminated with quinine. He made a prompt recovery, and returned to work in January, 1930. His health was improved, and he was elated over the results of the treatment. He told his physician that he was better than he had been for the last four or five years. I reëxamined him in October, 1930, and found his pupils reacted promptly, the strabismus remained the same, there were no tremors, and the examination was otherwise negative. The spinal fluid was examined by the same laboratory as formerly, and it was reported normal.

This man had developed a hernia in July, 1930. In November, 1930, he had this hernia repaired. Unfortunately, he developed pneumonia a few days following operation and died. An autopsy could not be obtained. This is also a case of neurosyphilis showing a paretic formula of the spinal fluid, which was reduced by malaria when the ordinary methods failed. At no time could a clinical diagnosis of paresis have been made.

Case 3.—A man, aged 29, consulted me December 6, 1928, complaining of occasional dizzy spells during the past two months. He also complained of occasional pain in the back of the neck, nervousness and fatigue. He gave a history of a chancre seven years ago, and during the year following he stated he had pain in the back of the neck. He received inadequate treatment. The present pain reminded him of the previous one, and he thought there might be some connection between the two.

The physical examination was negative. I found his pupils reacted to light and accommodation, and from an objective standpoint a diagnosis of asymptomatic neurosyphilis could be made. His spinal fluid showed Wassermann 4 plus; cells 52; gold sol. 5555542000; globulin 2 plus. He received thirty-eight treatments of tryparsamide, and about the same number of bismuth. In May, 1930, the blood Wassermann was positive. The gold curve was still strongly paretic; the spinal Wassermann was 4 plus; and cells 18; globulin 1 plus. During this course of treatment his subjective symptoms improved somewhat as far as the dizziness and pain were concerned. However, he still had spells of fatigue, and afforded a typical neurasthenic picture.

He was given malaria in June, 1930. In December, 1930, he reported that he has been working steadily since August, and that he felt much better. He is not suffering from so much nervousness and seems very grateful for what has been done for him. A spinal fluid examination on December 31, 1930, still shows a strongly positive fluid. The only improvement being noted is a reduction of cells from 18 to 4, and a 2 plus globulin reduced to a slight trace. The Wassermann reaction and colloidal gold remain the same as they were six months ago, prior to the malaria. He has had no other treatment since he had the malaria, but his spinal fluid finding will be checked at least yearly if possible.

Two of these cases were unmistakably neurosyphilis from a clinical standpoint. One is of the asymptomatic type from an objective sense. There was nothing characteristic about his complaints. In all three strong paretic type fluids were found, and the usual methods of treatment were unavailing after a fairly reasonable trial. Malaria reduced the spinal fluid findings in two, and has partially reduced the third within six months. They illustrate the type of case which, in my opinion, is best suited for malarial therapy, which constitutes the ideal method, for the present at least, of treatment of paresis. I am perfectly aware that perfection will never be obtained in the treatment of this disease, but the least we can do is to strive for the ideal. It may be occasionally possible to accomplish this by the method of treatment above described.

Final conclusions, of course, cannot be drawn from an investigation of three cases of this type. However, it may be concluded that to diagnose the more serious form of asymptomatic and symptomatic neurosyphilis, thorough spinal fluid examinations are necessary. Furthermore, these fluids are exceedingly hard, and often impossible, to reduce by ordinary treatment, but malaria can often accomplish this when other methods fail. Finally, it must be concluded that to derive the maximum benefit the treatment of paresis must be instituted before much parenchymal damage has been done. In order to accomplish this, the use of malaria in those cases which are in grave danger of later developing the disease, is advocated.

821 Lowry Bldg.

NEW MENINGITIS ORGANISMS DISCOVERED

A new group of epidemic cerebrospinal meningitis germs has been discovered at the National Institute of Health at Washington during studies conducted under the direction of the United States Public Health Service. This is the fifth group of these dangerous germs to become known.

During the last five years there has been more of this infectious disease in the United States than at any time since the World War. A wave of epidemic cerebrospinal meningitis has traveled slowly across the United States from the Pacific Coast, Dr. Sarah E. Branham, engaged in meningitis research at the National Institute of Health, said in remarking on the discovery. This wave manifested itself in severe outbreaks in many centers of population—as, for example, in Salt Lake City, Chicago, Memphis, Detroit, Indianapolis, Philadelphia, and New Haven.

The new group of meningitis germs was found while Dr. Branham and her co-workers were endeavoring to find an improved serum for the treatment of this disease. They were engaged at the time in examining more than 400 cultures from epidemic cerebrospinal meningitis collected from various sections of the country where flare-ups had appeared.

Outbreaks of cerebrospinal meningitis often seem to be spontaneous and are sometimes widely separated, Dr. Branham pointed out, because only a few individuals out of many persons who may carry the germs of spinal meningitis in the respiratory tract actually may contract the disease. These carriers, though, may spread the infection.

The germs of this disease are grouped according to "strains." Not all strains are alike in their power to produce the disease. Some are very virulent and deadly and more apt to cause a fatal form of the disease than other strains. More than 50 per cent of the cases in the recent epidemics of cerebrospinal meningitis have been fatal in some localities, while in other cities the deaths have been fewer.

Although primarily a disease of children, epidemic cerebrospinal meningitis affects adults also, especially those living under crowded conditions and following a radically changed routine of life. Such conditions aided widespread and fatal outbreaks of epidemic cerebrospinal meningitis during the World War among soldiers encamped in this country and abroad.

Although the "meningococcus," as this germ is called, was discovered by Weichselbaum in 1887, the fact that all strains were not alike was first recognized by the French bacteriologist, Dopter, in 1909, and recognition of the first four groups of cerebrospinal meningitis germs was made by Dr. M. J. Gordon, a British physician, and his co-workers, during the World War. The majority of the "strains" sent to the National Institute of Health during the recent epidemics in the United States have been found by Dr. Branham and her associates to fall into the four groups of Gordon. The new fifth group has been found to be predominant in some parts of the Middle West.

U. S. P. H. S.

THE PATHOLOGY AND PATHOGENESIS OF OCULAR MELANOMATA*

Walter E. Camp, M.D., F.A.C.S.
Minneapolis

THE term melanoma is used in the present study to designate all pigmented or pigmentiferous (potentially pigmented) tumors which are primary in the various coats of the eyeball. Such a group includes pigmented and unpigmented nevi of the ocular conjunctiva; pigmented and unpigmented sarcomata of the iris, ciliary body and choroid. In the older literature these tumors of the uveal tract were called leukosarcoma and melanosarcoma.

Ocular melanomata form a part of a larger group of pigmented tumors which are also found to be primary in the skin, meninges, rectum and adrenals. The bizarre appearance of this entire group, including those of the eyeball, is well known. In their histological appearances they may simulate a sarcoma, carcinoma, angioma, endothelioma and nephroma or hypernephroma. It is because of this pleomorphology that the pathogenesis of the ocular melanomata has been and still remains in a large majority of cases quite obscure.

EPIBULBAR MELANOMATA

Epibulbar pigmented tumors usually develop in situ in the bulbar or palpebral conjunctiva. In some cases, however, the growths in this location are due to extraocular extension of an intraocular pigmented tumor.

Primary epibulbar melanomata or nevi are congenital and benign but may become highly malignant. In structure and appearance they are very similar to nevi of the skin. Nevi of the conjunctiva most frequently occur in the bulbar conjunctiva just posterior to the limbus. In the majority of cases they are heavily pigmented, but in rare instances show little or no pigment even after study with serial sections. Grossly the nevi are black or reddish-brown spots of variable size. They are always smooth and may be flat or slightly raised and gelatinous looking.

In their histological appearance the conjunctival nevi resemble very closely those of the skin. The conjunctival epithelium is prolonged downward into the underlying connective tissue in the form of cords or club-like expansions which form a network or (as it appears in sections) nests of rounded or polygonal cells—the so-called nevus cell. In many instances the nests of nevus cells are surrounded by numerous small blood vessels and blood spaces, giving the appearance of an angioma or vascular nevus. In other cases cystic spaces of variable size are formed in the cords or nests of nevus cells, forming a cystic nevus. Pigmentation is quite marked in the majority of cases. The granules of melanin are found both intra- and extra-cellular. The surface or outermost layer of cells usually shows more pigmentation than the deeper layers.

Owing to the polymorphic nature of the nevus cell, its origin has furnished a problem of long debate. Unna, Post, Wieting, Dawson, and Broders and McCarthy believe that the nevus cells have their origin from epithelium. Ribbert, on the contrary, believes the nevus cells have their origin from the pigmented branching connective tissue cells or chromatophores of the corium. Recklinghausen believes they have origin from the endothelial cells of the lymph vessels.

Dawson, in his recent monograph on the melanomata, shows very clearly, both in the cutaneous and conjunctival melanomata, the origin of the tumor cells from the rete cords of the surface epithelium. The basal cells of the rete cords proliferate and form intraepithelial cell nests. These nests enlarge, break through the basement membrane, and form club-like expansions which grow down into the underlying connective tissue in anastomosing cords, forming a reticulum of tumor cells. In its subsequent development the melanoma usually assumes one of three forms.

1. The cell nests grow down into the underlying connective tissue, retain their round or polygonal shape. arrange themselves in an alveolar or acinous grouping resembling an epithelioma or carcinoma.

2. The cell nests break up and form a syncitium of elongated branching cells resembling a sarcoma.

---

*Thesis read before the Minnesota Academy of Medicine, at its regular monthly meeting of March 11, 1931.

3. The cell nests form a syncitium of branch- g elongated cells which become permeated by ew formed capillaries simulating an endotheli- na.

The majority of congenital nevi of the con- nctiva, like those of the skin, remain benign d undergo fibrosis and degeneration. The ree preceding forms just described represent ocesses which may develop as a result of ma- gnant change. Other characteristics of malig- ncy are increase in size of the tumor, increased scularity, hyperchromatic nuclei, and numer- s mitotic figures.

INTRAOCULAR MELANOMATA

Intraocular melanomata have their origin in e tissues of the uveal tract, *i.e.*, the iris, ciliary dy, and choroid. In rare instances primary elanotic growths have been described as aris- g in the sheath of the optic nerve. The intra- ular melanomata are usually primary, a search the literature revealing only three instances metastatic melanoma reaching the eye by me- stasis from cutaneous melanomata. The most cent of these was reported by Cordes and Hor- r at the last session of the American Medical ssociation. In all of these metastatic cases the es became involved as a part of a generalized elanosis.

Nevi or benign melanomata of the iris are not frequent. They may involve any part of the is, but are more commonly situated near the pillary margin. They may be single or mul- ple, and are of variable size. Grossly they ap- ear as flat pigmented spots or small circum- ribed tumors.

Microscopically nevi of the iris resemble very osely those of the conjunctiva and skin. The evus cells may simulate those of carcinoma, sar- ma, or endothelioma. Since there is no epithe- um on the surface of the iris, the origin of these evi has furnished considerable discussion. napp in 1869 described a circumscribed new owth in the iris consisting of branching anas- mosing cells, mostly pigmented, which he ought developed from the chromatophores nor- ally found in the iris. Fuchs and Anargyros escribed diffuse, deeply pigmented tumors in e iris stroma which they believe develop from e pigment epithelium of the iris. These most equently are located at the pupillary margin the iris, where two layers of the secondary optic vesicle unite. A marked proliferation of the pigment epithelium in this region is normally present in the iris of the horse.

These melanotic spots in the iris are practically always benign and remain unchanged for years. Occasionally, however, they become malignant and develop into tumors which in most cases resemble sarcomata. Rare examples in which the tumor cells resemble endothelioma and carcinoma are described. In our collection we have one specimen of a well developed circumscribed nevus which shows beginning malignant change.

Primary malignant melanoma or so-called sarcoma of the iris is rare. According to Fuchs only about 6 per cent of all malignant melanomata involving the uveal tract are found in the iris; 9 per cent are found in the ciliary body and 85 per cent in the choroid. The iris is frequently involved secondarily by direct extension of melanomata from the ciliary body and occasionally from the choroid. Primary malignant melanotic tumors of the iris are usually of the diffuse type, as contrasted to the globular circumscribed growths of a similar nature which involves the ciliary body and choroid.

It has been shown by Treacher, Collins, Ewetzky, Hirschberg, Hosch, Whiting, and others that many of these malignant tumors of the iris develop from congenital nevi which have been quiescent for many years. Dawson believes that malignant melanomata of the iris can develop from any of the pigmented tissues of the iris. This would include the chromatophores, the pigment epithelium and congenital nevi. From a study of the literature and from a study of the specimens at our disposal, it is evident that only rarely can it be shown that these tumors arise from the pigment epithelium of the iris.

While the majority of malignant melanomata of the iris are diffuse growths, occasionally they are nodular in character and quite vascular. In some instances the growth may form multiple nodules scattered through the stroma of the iris. These in all probability represent localized metastases through the blood vessels or lymph spaces. In rare cases the tumor may spread diffusely throughout the entire circumference of the iris forming a so-called annular or ring sarcoma. Annular malignant melanomata of the iris are very rare. The first reported case was by Solomon in 1882. Since that time only eight similar cases have been reported in the literature. One of these cases was reported by Dr. W. R. Murray in the American Journal of Ophthalmology for 1927. I had opportunity to make a rather complete pathological study of the eye in this case and for this reason wish to report it in detail.

The case is that of a farmer boy, nineteen years old, who came to the University Hospital complaining of gradual loss of vision in the left eye for a period of three weeks. His parents had noticed a change in the color of the iris in this eye about one year previously. There was no history of injury and there had never been pain or discomfort at any time.

Examination showed a mild injection of the bulbar conjunctiva and anterior ciliary vessels. The anterior chamber was very shallow; the pupil was dilated and immobile. The iris showed scattered areas of deep pigmentation extending from the root of the iris to the pupillary margin and involving its entire circumference. The pigmented spots were of variable size, and were not raised above the level of the surface of the iris. The lens showed a few pigment spots on its anterior surface. There was deep glaucomatous cupping of the optic disc and secondary atrophy of the optic nerve. The intraocular tension was 45 mm. Hg. Vision was reduced to light perception. The right eye was normal and had normal vision. The eyeball was enucleated and showed the following gross and microscopic pathology: Gross diameters of the eyeball were about normal. The cornea was clear. The anterior chamber was very shallow. The pupil was dilated and oval in outline. The iris was thickened in its peripheral portion and adherent to the cornea throughout its entire circumference, completely obliterating the filtration angle. There were no circumscribed nodules to be found in the iris. Pigmented areas were present on the surface of the iris extending from the periphery to the pupillary margin. The lens was slightly pushed forward, but was clear except for a few pigment spots on its anterior capsule. The vitreous was clear; the retina and choroid appeared normal. The optic disc was deeply cupped.

A portion of the eyeball was embedded in paraffin and a portion in celloidon and serial sections cut at intervals of 10 to 15 micra. The corneal epithelium, Bowman's membrane, corneal stroma, and endothelium were normal. The conjunctival vessels at the limbus were congested but there was no chemosis nor evidence of epibulbar extension of the growth. The root of the iris was uniformly thickened and adherent to the cornea for a distance varying from 0.5 to 1.5 millimeters. The thickening of the iris was due to a diffuse tumor involving the entire circumference of the iris and extending onto the posterior surface of the cornea and also for a short distance into the ciliary body. The tumor was composed of round and spindle-shaped cells, many of which were deeply pigmented. In some places where the cells were more densely packed there was a tendency to alveolar formation. There were a few mitotic figures present. There wer no giant cells, hemorrhage or necrosis. The tumo cells extended into the meshes of the pectinate ligament and into the ciliary body for a short distanc In a few sections the tumor cells were found extending into the sclera along the anterior ciliary vein The ciliary body was thinned and atrophic. The opti disc showed deep glaucomatous cupping and secondar optic atrophy. The diagnosis was annular malignan melanoma of the iris involving the cornea and ciliar body; secondary glaucoma; secondary optic atroph The origin of the tumor cells in this case could not b ascertained, but from the character of the cells an the history of slow onset, it was probable that th growth developed from a preëxisting congenital nevu or possible multiple nevi.

About 9 per cent of all intraocular malignan melanomata are found in the ciliary body. In th vast majority of cases the tumor assumes a circumscribed globular shape or becomes pyramida in outline, resembling the shape of the ciliar body itself. In rare cases the tumor is flat an infiltrating in character and may encircle in par or entirely the circumference of the ciliary body similarly to that just described in the iris. Onl about fifteen cases of annular malignant melanomata of the ciliary body have been reported i the literature.

Melanomata of the ciliary body practically always involve the adjacent iris and choroid by direct extension. When the growth is located i the posterior portion or flat part of the ciliar body it is often difficult to determine whether i originated in the ciliary body or choroid. Retina detachment, which develops so early in choroida melanomata, comes very late or not at all in ciliary melanomata, especially when the tumor is located in the anterior part of the ciliary body.

The majority of ciliary melanomata are pigmented. These form the group of so-called melanotic sarcomata. Pigmentation is due to the presence of brownish-black granules of melani found both in the cell cytoplasm and intercellula stroma. The cell types in the pigmented tumor are similar to those unpigmented. The degree o pigmentation and its distribution vary considerably. In some cases only a few cells are pigmented, while in others the whole tumor is s deeply pigmented it is difficult to study the cel structure. In other cases one portion of the tumor may be entirely free of pigment, while another is heavily pigmented.

About 85 per cent of all intraocular malignan melanomata have their origin in the choroid ey may originate in any portion of the cho- id, but are much more common in its posterior lf. Fuchs states that 85 per cent of the choroi- l melanomata are posterior to the equator of e globe. The majority of choroidal melanoma- are circumscribed rounded growths that break rough the lamina vitræ (Bruck's membrane) d fill the greater part of the vitreous cavity. om its point of origin the tumor spreads lat- ally, forming a lenticular or disc-shaped owth which gradually thickens and ruptures e glass membrane. After reaching the vitreous amber the tumor grows more rapidly and ex- nds into a mushroom-shaped mass, pushing the tina forward. The retina early become de- ched by serous exudate over an area consid- ably larger than the tumor. Finally complete ial separation occurs. Occasionally the retina comes invaded by a rapidly growing tumor.

In rare instances choroidal melanoma develops a flat diffuse infiltrating growth involving a ge area of the choroid, but forming no circum- ribed growth. Owing to the flatness of the owth, the retina is usually not separated until ry late, and the lamina vitræ remains intact. is type of growth is similar to the annular or g tumors found in the iris and ciliary body.

The histology of choroidal melanomata is very milar to that of the ciliary body. Some of these owths show numerous new formed blood ves- ls and large blood spaces. These are often lled angiosarcomata. Due to their rapid owth, when once they rupture the lamina vit- e, necrosis is commonly found. In some cases e greater part of the tumor may be necrotic.

The minute structure and cytology of malig- nt melanomata varies considerably, not only in fferent tumors, but also in different areas of e same tumor. In the literature most classifi- tions are based upon the shape and arrange- ent of the individual cells and their degree of gmentation. Fuchs, in his monograph on tumors the uveal tract, enumerated fourteen types. erschbaumer listed six, while Lagrange recog- zed two main groups: (1) the pigmented and on-pigmented sarcomata; and (2) the endothe- l sarcomata or tumors supposedly originating the endothelium of the perivascular lymph aces.

In the rapidly growing, circumscribed tumors, e predominating cells are spindle-shaped, often osely packed together, with little or no pigment, and a goodly number of mitotic figures. This type of tumor is the leukosarcoma of the old literature and closely resembles sarcoma found in any part of the body. The cells are elongated or fusiform in shape, of variable size and have a large chromatic nucleus. The cells are closely packed, with little or no stroma, and form bundles which interlace in various directions. In the smaller group of tumors the predominating cells are rounded or oval with blunt processes. The cells vary greatly in size, and when closely packed may be polygonal. Some tumors exhibit both spindle and round cells, forming a mixed cell type. In all of these types a few scattered multinucleated cells may be found. In rare instances, however, giant cells are abundant.

The origin and nature of the pigment in melanotic tumors has been the subject of long and elaborate investigation and much debate. It has been conclusively shown, I believe, that melanin is a direct result of cell metabolism. It is usually free from iron and sulphur, but rapidly unites with these elements, and for this reason may in some instances give the iron reaction. It occurs in granular or rod-shaped masses, both in the cell, and in the intercellular stroma. That melanin is a product of oxidation of its precursor melanogen which occurs as colorless granules in the cell cytoplasm is a generally accepted fact. Hibbert, Schieck, Gilbert and others have shown that unpigmented melanomata become pigmented when exposed to sunlight or through other processes of oxidation. The melanin in the urine in cases of melanuria is manifest only after oxidation of the melanogen.

All intraocular melanomata show, in their development, four stages of growth. The first stage represents the early development of the growth before the onset of secondary glaucoma. The second stage is that of secondary glaucoma. The rise of intraocular pressure is due to one of two causes: (1) a blocking of the normal filtration angle, either by tumor cells or by forward pushing of the lens and iris; (2) by obstruction of the vortex veins by direct pressure of the tumor. The preglaucomatous period may last from one-half to two years, depending upon the degree of malignancy of the growth. During this period there is usually no pain or other symptoms except loss of vision. The glaucomatous period usually lasts for only a few months and is accompanied by pain and symptoms of secondary inflammation. The third stage is that of extraocular extension, which in the case of flat, diffuse or infiltrating growths may come very early. Melanomata of the iris and ciliary body usually show extraocular extension along the anterior ciliary vessels which perforate the sclera at the limbus. Tumors in the posterior half of the ciliary body and choroid show extraocular extension along the vortex veins which are located at the equator of the globe. Tumors in the posterior half of the choroid show extension along the optic nerve and the posterior ciliary vessels and nerves which perforate the sclera around it.

The fourth stage is that of metastasis. Metastasis may come very early, even before the onset of secondary glaucoma. In other cases the metastasis may come very late. Cases are reported where metastasis has occurred eighteen years after enucleation. Metastasis is always by way of the blood vessels. The neighboring lymphatic glands are never involved. Local recurrence after enucleation is uncommon. In the older literature Parvel reported nine local recurrences in eighty-nine cases. In more recent years the percentage of local recurrences is much less, probably due to earlier diagnosis, *i.e.*, before the onset of extraocular extension.

The most frequent site for metastasis is in the liver. Most cases show, however, multiple metastases involving the liver, lungs, stomach and other viscera. Metastatic melanomata may involve any organ or tissue in the body and quite a few cases of generalized melanosis have been reported. The metastatic growths frequently have little resemblance to the original tumor. The cells may be large, vacuolated and unpigmented, resembling those seen in nephroma or hypernephroma. They may assume the character of epithelial cells or of connective tissue cells, simulating either carcinoma or sarcoma.

I wish to describe a case of malignant melanoma of the choroid in which we were able to make a rather complete pathological study.

The patient, a housewife, aged 54, reported for examination, complaining of gradual loss of vision in the right eye following an injury twenty years previous. For the past three years the right eye has been totally blind. She had had no acute pain but at intervals the eyeball had been red and tender. The left eye was normal with normal vision. About two months ago she noticed a small shot-like lump in the scalp and one in the skin over the ribs on the right side of the chest. These nodules were hard, freely movable, and slightly bluish in color. During the next few weeks
she noticed similar nodules developing in the axill
groins, and in the skin of the abdomen. She had
cough, no loss in weight, and felt perfectly well, exce
for the symptoms described above.

Examination of the eye showed injection of the co
junctival and anterior ciliary vessels. The cornea w
normal. The iris was thin and atrophic and push
forward against the cornea, obliterating the anteri
chamber. The pupil was irregular and eccentric a
showed no reaction to light. The lens was cataracto
preventing an ophthalmoscopic examination. The
was no light perception present. Tension was 60 m
Hg. as compared to 20 mm. Hg. in the left e
Transillumination of the globe showed the outer h
opaque. Examination of the sclera showed a round
bulging mass perforating the sclera in the upper a
outer portion near the equator. Aside from the sk
nodules described above, the general physical exam
nation was negative.

A diagnosis was made of malignant intraocul
melanoma with multiple skin metastases. This was co
firmed by biopsy of one of the skin nodules and en
cleation was done. Microscopic sections of the eyeb
showed a large melanotic tumor involving the choro
and ciliary body, and showing extraocular extensio
both at the equator, along the vortex veins, and al
posteriorly along the optic nerve. Large areas of t
tumor were necrotic and showed deep pigmentatio
The tumor cells were both round and spindle-shape

Six months after the enucleation the patient r
turned for examination. Her general physical cond
tion was good. The liver was not palpable and the
was no weight loss. Examination of the urine f
melanogen was negative. The skin nodules had i
creased in size and new ones formed at various plac
over the body. The socket of the enucleated e
showed a small, red, fleshy growth which on biop
proved to be an orbital recurrence. During the fo
lowing nine months the patient gradually failed; t
liver and spleen became enlarged and nodular. Dea
occurred fifteen months after enucleation. Autop
showed generalized melanosis involving practically a
of the viscera and serous surfaces.

The possible origin of the tumor cells in mel
nomata of the choroid is a question which h
long been discussed. Fuchs believes they ha
origin in the chromatophores of the extern
layers of the choroid—the layers of Sattler an
Haller. Ribbert agrees with this view and pr
poses the name chromatophoroma. Knigh
working with Broders at the Mayo Clinic, pu
lished a paper in 1924 in which she argues th
the pigment found in the chromatophores of th
choroid is phagocytised by these cells and is n
a product of their metabolism. She believes th
melanin is a product of the epithelial cells, pro
ably the pigment epithelium of the retina, an
that melanotic tumors of the choroid are to b

sidered as having their origin from ectoderm s and should therefore be called melanocarci- ia. Dawson, in his monograph on melanoma- describes thirteen cases of choroidal melano- a. In twelve of these he was convinced that tumors originated from the chromataphores the vessel layers of the choroid. In the re- ning case, which showed great diversity of cture, he described the tumor as arising from hexagonal pigment epithelium of the retina. vson also agrees with Knight and Broders the so-called chromatophores of the choroid derived from the pigment epithelium of the ia and are therefore to be considered ecto- mal and not mesodermal in origin.

wing, in his treatise on neoplasms, is inclined the opinion that these melanotic tumors of uveal tract may arise either from the pig- it epithelium or the chromatophores. He is convinced, however, that the chromatophores epithelial in origin. In ciliary melanoma he nd a splitting off of the heavily pigmented al epithelial cells.

From a study of the specimens at our disposal it would appear that the epibulbar growths take origin from the basal cells of the conjunctival epithelium similar to the process which occurs in the cutaneous nevi. The melanotic growths in the iris and ciliary body may arise directly from the pigment epithelium, or, as is more frequently the case, from the chromatophores in the vessel layers. The origin of the chromatophores is uncertain, but certainly the large, rounded, heavily pigmented "clump" cells found in the vessel layer of the iris near its pupillary margin are derived from ectoderm. In all of our specimens of choroidal melanomata the tumor cells apparently had their origin from the chromatophores. In no case was the pigment epithelium of the retina disturbed except by secondary invasion of the tumor. The possible origin of choroidal melanoma from congenital epithelial cell nests or "rests" which may become irritated by inflammation or injury cannot be disproven. A history of malignant melanoma developing in an eye long blinded by inflammation or trauma is quite frequent.

IRON AND COPPER IN THE DIET

here have developed evidences that certain minerals ch occur in small quantities in natural foods enter the nutritive exchanges of the organisms in ways e important than has heretofore been believed. many years claims of the biologic significance of a ıber of such elements have been heard. They are ost inevitable contaminant of foods, so that it has extremely difficult to determine decisively whether , nickel, cobalt, manganese, copper and others are ice constituents of the animal organism, or whether or more function in some essential process. Re- ly attention has been focused on one of these ele- ts by the discovery that copper possesses the prop- of supplementing iron in forming hemoglobin in certain types of experimental anemia. Nutritional anemia can apparently be best corrected in several species by the addition of copper as well as iron to the defective rations. There also is considerable evidence that important functions are performed by manganese. Many analyses of foods concerning the mineral content have become available so that the daily intake of these elements may be judged. Wheat bran, blueberries, whole wheat, split peas, and navy beans are rich in manganese. Calf liver, oysters, beef liver, mushrooms, currants and chocolate are rich in copper. Pork liver, beef liver, spinach, lima beans, calf liver, and navy beans are rich in iron. Vegetables and cereals are the chief contributors of iron. Fruits are an important source of all three elements. (Jour. A. M. A., July 18, 1931, p. 180.)

THE AMERICAN RITE—TONSILLECTOMY*

W. W. Lewis, M.D.
Saint Paul

APPROACHING closely in breadth and extent of practice the Jewish rite of circumcision, tonsillectomy on infants and near-infants as carried on in America today will soon be in the lead. Fortunately, like other excesses of bygone days, it will be just as precipitately repudiated when the pendulum of rational consideration begins its return swing and its enormity of error is realized.

If Mother Nature ever amplified her protest against misdirected surgical interference, it is most forcefully manifested in her almost desperate effort to replace this lymphoid-glandular tissue of which she has been robbed, which is so unmistakably a necessary part of the lymphatic system of defense and probably, too, of the internal secretions in all young mammalian creatures.

The picture, in these little post-tonsillectomized throats, of multiple hypertrophied buds of lymphoid tissue sprouting out from all over the surface of the posterior pharyngeal wall, and the pillow-like masses of lymphoid accumulations in the lateral pharyngeal folds, only too plainly shows Nature's heroic effort to replace this lost tissue. The rapid regeneration of the tiniest islands of follicular tissue left in the tonsillar fossæ and the plica tonsillaris into almost "new tonsils" attests plainly to the proof of the need for this glandular-lymphatic tissue in the throats of these youngsters during infancy and childhood, at least up to the age of puberty, at which age, normally, these lymphoid structures begin to recede in size and importance of function.

The practically unbroken tonsillar ring of the lower animals, comparatively present in humans, also, made up of the lingual tonsils, the faucial tonsils and the nasal tonsils, certainly indicates the importance of the function of these structures. Reports have appeared in the literature of experiments upon lower animals where part of the tonsillar ring has been removed, following which the health of these animals, observed for periods of time, showed marked deterioration, terminating in severe anemia and marked d bility.

Just as certainly as the lower animals, wh use their mouths in working, fighting, dressin their wounds and making their toilet, need pr tection against infection in the oral cavity, s young humans, too, need the same protectio during the period of life when everything withi reach goes to their mouths.

Every region of the body is protected by definite localized arrangement of the lymphati system, and surely the oral cavity can be no e ception, where in reality it would seem to b more needed than in any other region of th body.

The indications for tonsillectomy universall accepted are: Hypertrophy with obstruction prolonged local inflammatory disease in the tonsi as indicated by continuous cervical gland involv ment; glandular dyscrasia, a perverted or hyper secretion of the tonsils which unfavorably affect the child's general ruggedness; and systemi poisoning from focal infection.

Tonsillectomy as a whole problem should b divided sharply into three groups for best con sideration, because the indications in thes groups are considerably different one from th other.

Group I. Tonsillectomy in infants and near infants.

Group II. Tonsillectomy in children (pas infancy) up to the age of puberty.

Group III. Tonsillectomy in subjects pas the age of puberty.

In the last group, especially after adolescence tonsillectomy is done largely on account o systemic poisoning from focal infection; less s on account of recurring local acute inflammator disease; least of all on account of hypertroph with obstruction; and not at all on account o glandular dyscrasia.

In the second group, children (past infancy up to the age of puberty, tonsillectomy is don largely on account of hypertrophy with obstruc tion; also on account of glandular dyscrasia ich unfavorably influences the nutrition or wth of the child; less so on account of pro- ged local inflammatory disease with cervical nd involvement; and least of all on account of temic poisoning from focal infection.

---

*Read before the Minnesota Academy of Ophthalmology and Otolaryngology, Minneapolis, March 13, 1931.

n considering the first group (infants and r-infants), let us eliminate practically all of indications universally accepted for tonsil- tomy as a whole and mentioned, also, in con- ering each of the other groups named.

ystemic poisoning from chronic local and al infection in the tonsils of infants surely is to be considered as a probability nor as a son for tonsillectomy.

ecurring local acute inflammatory disease of tonsils occurs but rarely in infants as com- ed with older children, youths or adults. It is, vever, a fortunate defensive reaction when it s occur, and to remove these lymphatic first- e fortifications seems to me poor practice.

Hypertrophy of tonsils in infants (that is, real pertrophy, not merely congested, temporarily ollen tonsils) must, indeed, be a rarity, and glandular dyscrasia of older childhood (five ten or twelve years of age) is surely not to considered as occurring in this group.

The role of the thymus, rapidly terminating er birth, suggests an important part played by sil-gland structures as internal secretory or- ns in developing creatures, and its function in natal life probably compares closely with the essity for glandular-lymphoid-tissue function youngsters from birth up to puberty. The essity for the functioning of each seems to limited, comparatively, to certain respective iods of development, after which periods re- sion of function is manifested by atrophy, nplete in the thymus and relative in the tonsils.

Nor are development and hyperdevelopment of s glandular-lymphoid tissue limited to the l and nasal surfaces. Other exposed mucous mbrane surfaces (namely, the conjunctivæ) quently show during childhood overdeveloped nphoid tissue. The so-called follicular con- nctivitis, really lymphoid hyperplasia, is, too, tinctly a condition limited to life prior to berty.

Tonsillectomy in adults, generally speaking, is dom done without justification. In the first ce it is always considered in connection with me complaint of the patient, either systemic local, for which he is seeking relief. If a systemic malady, his case has been gone over thoroughly by his physician. Much thought, usually, has been put forth, possibly by several consultants, and a fair unanimity of opinion reached before he, himself, consents to the recommended procedure. If of a local character, his complaint is nearly always of repeated occurrence sufficiently severe to lead him to a fixed determination to rid himself of such recurrences. As a result, to repeat, seldom is tonsillectomy done in adults without full justification.

In youth the same and corresponding general conditions obtain, and, again, we can almost as certainly say tonsillectomy is seldom done in patients of this age without justification.

When we come, however, to tonsillectomy in children, between the age of infancy and puberty, as a group and in general, no such certainty of justification can be assumed. In the great majority of children at this age, tonsillectomy is done routinely, without much consideration, independent of and indifferent to consultation, with little thought, I think I can safely say, further than to arrangement of time and place, acquiesced in by parents, "following the leader," and for no greater reason than that the child next door has had his tonsils out, and it seems the proper thing to do.

At this age, in cases of glandular dyscrasia, comparable to hyperthyroidism, where the child seems to be held back in nutrition, growth and general ruggedness, no more remarkable improvement and favorable results are accomplished anywhere than by tonsillectomy.

In the occasional cases of systemic poisoning, manifested by chorea, arthritis, and so forth, tonsillectomy also brings relief when the focal point is correctly located.

Tonsillar hypertrophy (that is, real hypertrophy) with obstruction is also an acceptable reason for tonsillectomy in growing children, because such an hypertrophied structure, taking on much of a fibroid or scar-tissue infiltration, is relatively an incompetent gland, and, leading up to subsequent atrophy, affords little of the protective function of the normal or near-normal tonsil.

Unfortunately, much of the so-called hypertrophied tonsils in children of this age is not genuine hypertrophy at all, but is merely congested and swollen tonsils putting up their normal defensive reaction against infection, after which siege they rapidly return to their normal size and character. To remove such tonsils as these is to deprive the child of the most vital first-line fortification of his lymphatic defense-system in this region. Repeated congestion and swelling of the tonsils, over and over again, do lead to real hypertrophy, with an accompanying decline in the competency of the gland.

We have, then, in this group, two justifiable reasons mainly for tonsillectomy; viz., glandular dyscrasia and genuine hypertrophy with obstruction.

A third indication, too, is to be accepted, and that is in cases of continuous and prolonged involvement of the cervical glands, pointing unmistakably to the presence of infection in the tonsils which those structures seem incapable of overcoming or throwing off.

Here, also, we must differentiate between cervical glands of long-continued involvement and the cervical glands acutely enlarged and swollen only as a part of a temporary reaction against an acute infection in the throat, after the subsidence of which they rapidly recede to their normal or near-normal state. Both the tonsils and the cervical glands under such circumstances are but playing their normal part in such reaction, and certainly should not be condemned. They have participated in a good fight, have been on the winning side, and after recuperation and replenishment are thoroughly capable of participating in the many fights to come.

In the first group (namely, infants and near-infants) tonsillectomy in recent years in America has come to be a procedure of breadth and extent never practiced by men of the nose-and-throat specialty when this work was almost entirely limited to their field. During that time and, in fact, even today tonsil and adenoid surgery in infants and near-infants, universally speaking, is frowned upon by our specialty.

So far as I am familiar with the work of nose-and-throat men locally and abroad, adenectomy in persistent middle-ear cases is about the extent of the occasional surgery done in these little people, and is about all that has any real justification.

Of all the indications for tonsillectomy enumerated above (viz., real hypertrophy, secretory dyscrasia, chronic local disease, or foc infection leading to systemic poisoning) not o is the rule in infants. Nor is the tempora swelling of defensive reaction in the tonsils mo or less than a very laudable and beneficial r action in the presence of infection.

Some of the most severe anginas that we se with profound systemic toxemia, are in the tonsillectomized throats, where Nature has bee robbed of her defense.

So far in the discussion of this subject ad nectomy has not been considered, although, fact, it alone, without tonsillectomy, is usual about all that is justified in infants, and th practically only for the purpose of clearing persistent middle-ear infection.

Many men, even in our specialty, seem undi posed to think of adenectomy except in conne tion with tonsillectomy, and for no other goo reason than custom and habit. If adenectomy children, especially in infants, is alone indicate then poor surgical balance, surely, is shown doing more.

It is not the purpose of this paper to cov the entire subject of tonsillectomy and methods, but to arouse consideration and discu sion of a matter which I think is soon to bri us embarrassment and chagrin, and which is ready of uncomplimentary note in popular pu lications.*

I have felt for years, and I know that mo of my confreres in this specialty have had t same thought, that tonsillectomy in children pa infancy has been tremendously overdone, a that it not only has been of no benefit but h been distinctly disadvantageous to a large pr portion of this group. And, further, that tons lectomy in infants, so much on the increase du ing the past few years, has seldom been justifie that it has, generally speaking, been distinctly a entirely wrong, and that we should put oursel on record against it in no uncertain terms.

In this widespread, ill-advised surgical activi it should be a matter of satisfaction that we, a specialty, are not responsible for its inaugu tion, and are not now contributing toward continuance or increase.

---

*Collier's, Feb. 21, 1931; Harper's, February, 1931.

A SUMMARY OF THE INDICATIONS, TECHNIC AND RESULTS TO BE EXPECTED IN THE USE OF BOTH ARTIFICIAL AND NATURAL HELIOTHERAPY*

Ernest S. Mariette, M.D., F.A.C.P.
Oak Terrace, Minnesota

HELIOTHERAPY occupies such an important place in the treatment of tuberculo- s that a summary of its present status seems arranted. This summary is being prepared as art of a report of a committee of the American anatorium Association on the value of modern berculosis therapy. For more detailed informa- on its readers are referred to the bibliography.

HISTORY

The earliest medical writings contain many eferences to the use of light in the treatment of isease. The Greeks and Romans constructed olaria in their homes and the Egyptians fre- uented sandy beaches. This was probably due the sense of well-being which followed the unbath rather than to the appreciation of any pecific therapeutic properties of light. Oribasius ttempted to popularize light in about the 5th entury A. D., and McCollum and Simonds[1] laim that there is evidence of the use of artificial ources of light at about that time. With the ex- eption of an occasional disciple such as Avicen- ia, whose method formed the basis of our echnic, Henry de Moville, Gaddesden and aracelsus, light therapy appears to have been orgotten until the latter part of the 18th Cen- ury, when it was revived by the French, for use n the treatment of arthritis, tuberculous peri- onitis and Potts' disease. About 1840 Ollier and oncet and Bonnet reported good results in the reatment of arthritis and recommended general ody radiations. The first use of sunlight in a anatorium is credited to Richli, who, although e was not a physician, reported surprisingly ood results in 1885 on patients treated at eldes. Finsen, who was the first to study light cientifically, reported his results in the treat- nent of lupus in 1890. In 1902, Bernhard of St. Moritz, impressed by the success of the local utchers in "curing" their meats in sunlight, ex- osed suppurating wounds to its rays. His re- ults were so successful that he extended its use to cases of surgical tuberculosis using general body radiations. In 1903, Rollier began his now famous work at Leysin. It is due to the efforts of these two men that heliotherapy has become so popular. Their followers, among whom we are to be included, use solar therapy by increasing graduated exposures of the body to sunlight in air. Prior, Hyde and LoGrasso have so popularized heliotherapy in this country that all of the more recently constructed sanatoria contain provisions for its use.

The pioneers in artificial light therapy were Finsen and his followers, Reyn and Ernst. Finsen employed local radiation while Reyn and Ernst advocated general body radiation. In England Sir Henry Gauvain employs natural sunlight and seabathing and utilizes the carbon arc and the quartz mercury vapor lamp and the other sources of artificial light.

PHYSICAL CHARACTERISTICS OF LIGHT

Before proceeding with the indications and technic and results to be expected from both natural and artificial heliotherapy, I believe a brief discussion of the physical characteristics of the various sources of light, as well as their physiological effects, is warranted.

Light has been defined as an electro-magnetic disturbance of the ether. These disturbances travel through the ether in wave form at a rate of 186,300 miles per second and their frequency varies inversely as the length of the wave. The unit of measurements of the shorter wave is the angstrom unit, 1/10,000,000 of a mm., while in the infra-red region the unit is the micron, 1/1000 of a mm., and in the radio wave lengths it is the meter. When the disturbances or radiations are arranged according to the wave lengths, they present a definite spectrum (Fig. 1). At one end are the cosmic rays, so short and of such a high frequency that no one has yet been able to define their limits. At the other end of the spectrum are the long radio waves. According to Luckiesh[2] these measurements constitute

---

*From the Medical Department, University of Minnesota and len Lake Sanatorium.

"a locality in the wave length scale without being definitely fenced," so the figures given mark the approximate upper limit of the various zones. In general, the spectrum consists of a visible portion from the violet to the red of wave lengths from about 3,900 to about 7,600 A. U. flanked on either side by an invisible spectrum which begins with the ultraviolets and infra-reds and includes the other rays mentioned. The violets and ultraviolets are the chemically active rays, the reds and infra-reds being the heat producing rays.

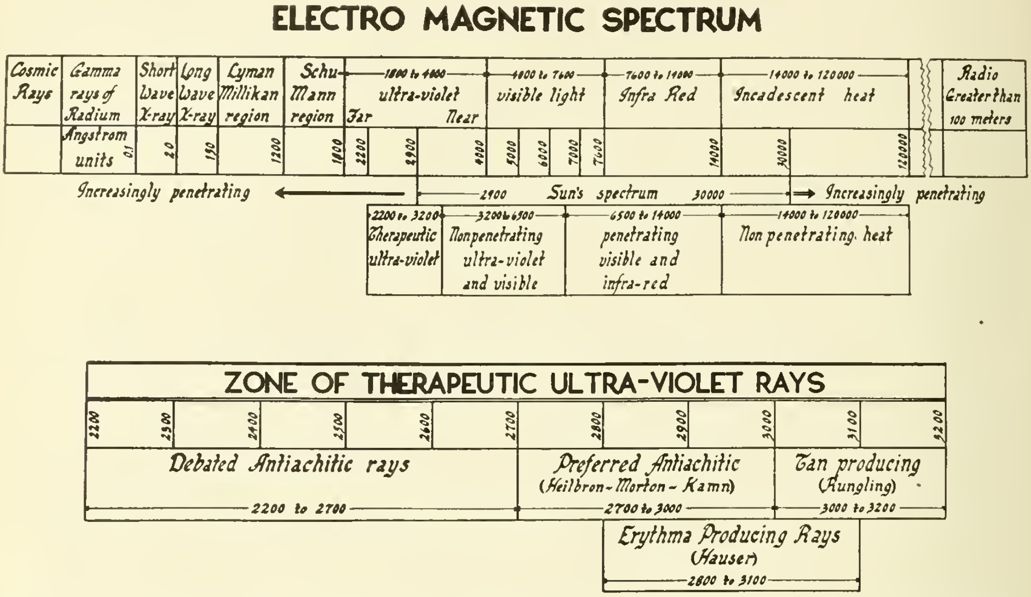

ELECTRO MAGNETIC SPECTRUM
Cosmic Rays
Gamma rays of Radium
Short Wave X-ray
Long Wave X-ray
Lyman Millikan region
Schu-Mann region
1800 to 4000
ultra-violet
Far
Near
4000 to 7600
visible light
7600 to 14000
Infra Red
14000 to 120000
Incadescent heat
Radio Greater than 100 meters
Angstrom units
0.1
20
150
1200
1800
2200
2900
4000
5000
6000
7000
7600
14000
30000
120000
Increasingly penetrating
2900 Sun's spectrum 30000
Increasingly penetrating
2200 to 3200
Therapeutic ultra-violet
3200 to 6500
Nonpenetrating ultra-violet and visible
6500 to 14000
penetrating visible and infra-red
14000 to 120000
Non penetrating heat
ZONE OF THERAPEUTIC ULTRA-VIOLET RAYS
2200
2300
2400
2500
2600
2700
2800
2900
3000
3100
3200
Debated Antiachitic rays
2200 to 2700
Preferred Antiachitic
(Heilbron-Morton-Kamm)
2700 to 3000
Tan producing
(Hungling)
3000 to 3200
Erythma Producing Rays
(Hauser)
2800 to 3100

Fig. 1. The Electro Magnetic Spectrum. This was compiled from material gathered from various sources. The measurements given represent zones in the spectrum rather than definite limits. The human organism in its struggle for existence has adapted itself to the rays of the sun's spectrum. This is the zone of moderate penetrability. The rays on either side of the sun's spectrum become increasingly penetrating as they increase or decrease respectively. The shorter rays such as the cosmic or Roentgen are more penetrating than the ultraviolet, visible or infra-red.

THE SUN'S RAYS

The sun's spectrum contains rays from about 2,900 A.U. to about 30,000 A.U., the earth's atmosphere filtering out the others. Therefore, any benefit to be derived from solar radiation must be derived from rays within those limits. From 1 to 5 per cent of the total output of the energy of sunlight is in the ultraviolet rays[3], that is, in the region from about 2,900 A.U. to about 3,900 A.U., the beginning of the visible rays. This variation depends not only upon the time of day and the season of the year, but also upon the latitude and the altitude and the condition of the atmosphere, that is, whether it is clear or filled with moisture, dust or soot. Thus it is obvious that all localities in the United States do not have the same intensity of sunlight. Greider and Downes[4] have considered the spectral energy curve of noon sunshine in summer and winter for Colorado Springs as representative of mountain sunshine, and East Akron, Ohio, as representative of low altitude sunshine (Fig. 2). The average of these four curves is called "Clinical sunshine" or "fall sunshine." It has been suggested that this average be used as a standard for comparison with artificial light.

According to Fabry, as reported by Coblentz[5] and others, the intensity at 2,900 A.U. is only 1/1,000,000 of that at 3,150 A.U. and only 1/40,000,000 of that of the visible spectrum. Coblentz claims that on the clearest day at noon hour in summer in Washington, D. C., the amount of ultraviolet solar radiation useful for preventing rickets (of wave lengths less than 3,100 A. U.) amounts to less than 0.3 per cent of the total incidence solar rays, which decreases to an imperceptible value at sunrise or during cloudy weather[6]. Thus the amount of ultraviolet rays in the sun's spectrum is relatively small. This fact should be considered when selecting the artificial light to be used as a substitute for sunlight.

Diffuse sunlight is particularly intense at the seacoast and diminishes with increased altitudes. When the sky is covered with clouds and the sun is hidden, diffuse sunlight may still be rich in actinic rays and useful for sun treatment. Between 10 A. M. and 2 P. M. the intensity of sunlight is maximal. It is at this time of day that the various short wave lengths are most abundant but the high temperature at these hours may be ntolerable for sun cure[7].

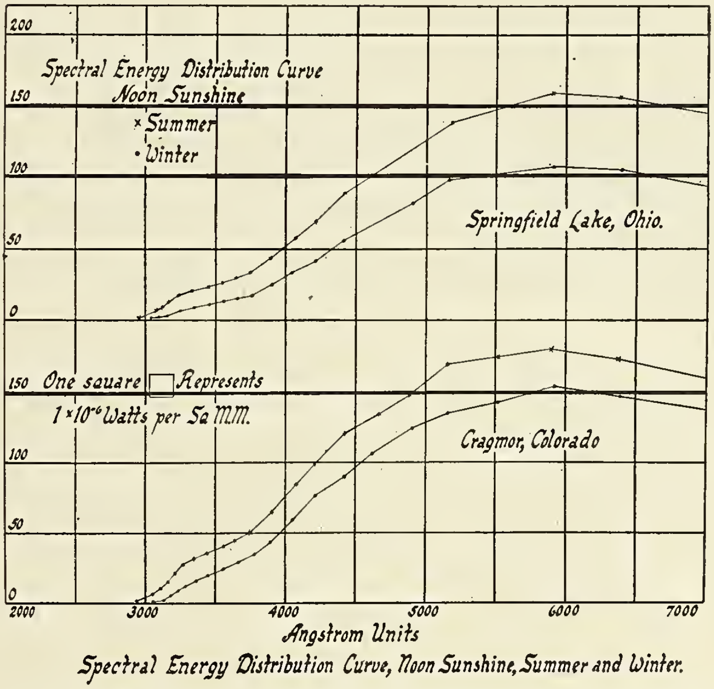


Fig. 2. Spectral energy distribution for mountain and lowland sunshine. Greider and Downes.

The ultraviolet rays are reflected by sand, snow and water, while water and water vapor absorb the infra-red rays above 14,000 A. U. thus increasing the relative intensity of the ultraviolet rays. Fog, however, will absorb the ultraviolet. Thus the best localities for heliotherapy are the seacoast, when free from fog, the desert and the mountains where the atmosphere is clear.

THE MERCURY ARC LAMP

There are three types of mercury arc lamps now in general use as artificial sources of light. Two of these use a quartz burner which trans-

TABLE I. NOON SUNSHINE INTENSITIES, WATTS $\times 10^{-7}$ PER SQ. MM.

	Antirachitic ultraviolet 2900-3100 A	Non-penetrating ultra-violet and visible 3100-6500 A	Penetrating red and near infra-red 6500-14000 A	Non-penetrating infra-red 14000-120,000 A
Springfield Lake, Ohio				
October, 1928	1.2	2894	3660	1760
May-June, 1929	2.3	3404	3786	1834
December, 1929	0.43	2440	3720	1615
Cragmor, Colorado				
November, 1928	1.6	3534	4432	1860
June, 1929	5.3	4233	4686	2211
January, 1930	1.1	3390	4565	1915
"Clinical Sunlight"	1.4	3214	4045	1810

mits rays down to about 1,850 A.U., and one of these has a special glass bulb or burner which absorbs the rays of less than about 2,800 A.U.

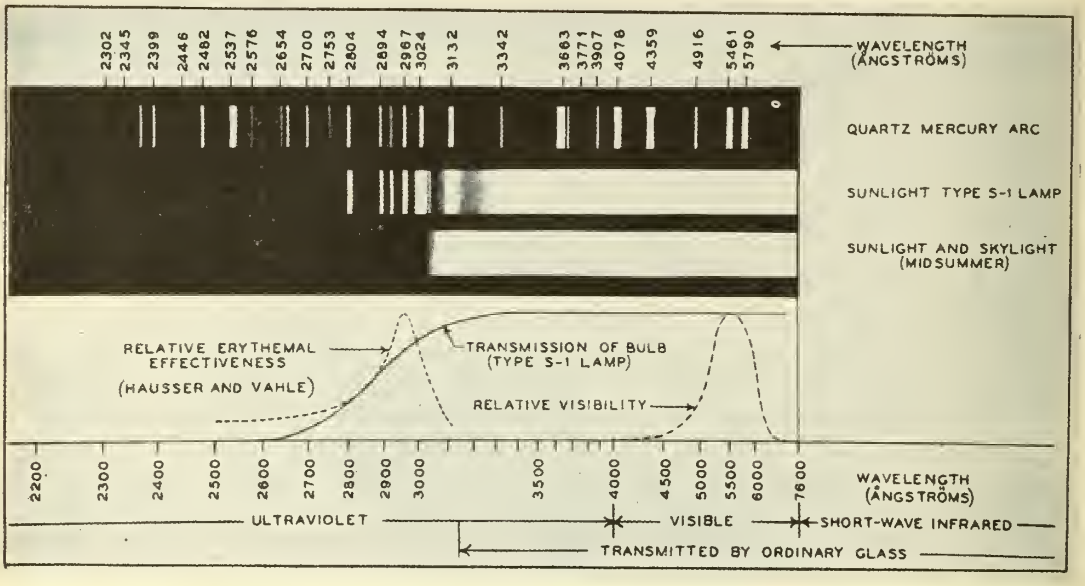


Fig. 3. Spectrum of S-1 lamp compared with that of a quartz mercury arc and sunlight as prepared by Luckiesh.

The difference between the two types of lamps using a quartz burner is, that in one, both electrodes are of mercury, while in the other, one electrode is of mercury and the other of tungsten. Both of these lamps are made in an air-cooled type for general body treatment and a water-cooled type for local radiation. Their spectrums begins at about 1,850 A.U. with a high proportion of ultraviolet to the total output. According to Coblentz[5], about 20 per cent of the total radiations are of wave lengths less than those found in natural sunlight (2,900 A.U.). As about[3] two-thirds of all the wave lengths less than 14,000 A.U. are of radiations below about 4,500 A.U., these lamps emit very little infrareds except from the heated quartz, the electrodes, the supports and the hood. In the tungsten anode type of lamp, some additional infrared radiations are obtained from this anode. When these two types of lamps are operated on the same energy input, there is very little difference in their ultraviolet output[8,9]. The short ultraviolets below 2,900 A.U. are very irritating but they have strong germicidal properties and should be of great value in treating superficial wounds. "Physically, there is no comparison between this type of radiation and that of the sun and it is hardly to be expected that these two sources of light will give the same results in all types of treatment."[8,9]

The more recently constructed quartz mercury lamps do not age as rapidly as those constructed several years ago.[9] Of the two types of lamps, the one with the tungsten and mercury electrodes seems to age slower than does the lamp with both electrodes of mercury.

Because clear distilled water does not in any degree absorb ultraviolet rays, Kromayer developed a water-cooled quartz mercury vapor lamp which is used very effectively for local applications.

The mercury arc lamp, S-1, with two tungsten electrodes is a combination of a mercury arc between highly incandescent electrodes of tungsten.[10] There is also a tungsten filament which operates in parallel with the mercury arc but at a considerably lower temperature than the electrodes. In this combination the ultraviolet rays from the mercury are supplemented with visible and infra-red rays from the tungsten, thus reducing the proportion of the ultraviolet in relation to the total output as compared with the two types of quartz mercury lamps discussed above. This lamp also uses a special glass bulb which absorbs the rays shorter than about 2800 A.U. and in that particular as well as in the greater proportion of infra-red it is more closely allied to the sun's spectrum. According to Coblentz,[10] the total intensity at a distance of three feet from the lamp, without the wire mesh cover, is about one-tenth to one-twelfth that of average solar radiation, and about 1.5 per cent of the radiations are of wave lengths of less than 3,130 A.U. The bulb blackens, however, with use due to a deposit on the inside and according to the manufacturers, should be replaced after 300 to 400 hours. Some bulbs, however, have had to be replaced after fifty to one hundred hours. The manufacturer has done this in some cases without any charge. Physically, the spectrum of this lamp is more closely allied to that of the sun than the spectrum from the other types of mercury arc lamps (Fig. 3). Therefore, it should give results more comparable to those obtained from the use of natural sunlight.

THE CARBON ARC

The carbon arc is the hottest source of artificial radiation readily obtainable and in this respect it is the closest approach to sunlight.[10] The radiation emitted from the carbon arc depends upon: the size of the electrodes and the metals with which the carbons are impregnated; the direction of the current when direct current is used; and the amount of electricity consumed. The white flame carbon emits relatively few ultraviolet rays of wave lengths shorter than about 2,200 A.U. It emits relatively more of ultraviolet from about 2,900 A.U. to about 3,100 A.U. than does the sun's rays. Also at about 3,890 A.U. it is relatively more intense than sunlight. In the visible portion of the spectrum, however, the sun's rays are more intense. The arc is strong in infra-red radiations of wave lengths longer than about 30,000 A.U. which the atmostphere has filtered out of the sun's rays.

When the carbon arc is covered with a Corex-D chimney which filters out the ultraviolet rays shorter than about 2,900 A.U. and infra-red rays longer than about 40,000 A.U., the white flame carbon emits a light which is the closest approach to natural sunlight we have.[10] Therefore, the results obtained in this type of artificial light should be more comparable to those obtained in natural sunlight, than from any other artificial source of light.

The manufacturer claims that the 60 ampere Eveready Carbon Arc Lamp with a white flame carbon and at proper distance (4 to 6 feet) from the patient will produce from 1 to 1.5 times the amount of ultraviolet rays of 2,900 to 3,100 A.U. present in "clinical sunlight." At a distance of six feet from this arc the total intensity of radiation is about one-fifth that of clinical sunlight and about one-sixth of one per cent of this radiation is of wave lengths shorter than 3,100 A.U.[11] By varying the distance of the carbon arc lamp from the patient, an intensity approximating "clinical" or "fall" sunshine may be obtained (Fig 4). If brought close enough to the patient, the carbon arc of low amperage may prove as effective as carbon arcs of higher amperage operating at a greater distance. The operating distance* for a patient undergoing treatment is a matter of trial and depends upon the results desired and the manner of radiation and cannot be determined by radiometric measurements.[5]

PHYSIOLOGICAL EFFECTS OF LIGHT

According to the law of Grothus formulated in 1819, light rays must be absorbed in order to be utilized by the body. As the ability of the body to absorb the rays varies with their wave lengths, it is obvious that their physiological effects vary also. The red and near infra-red rays, or the heat producing rays, have the greatest penetrating power. Their physiological effect is the effect of heat such as the production of a hyperemia and a pigmentation and the well known effects of heat on chemical reactions. The visible rays produce heat, light and metabolic changes. The ability of the violet and ultraviolet rays to penetrate the skin decreases as their wave lengths decrease, but the shorter the wave lengths the more readily are they absorbed by the skin. The heat rays through the production of a hyperemia enhance the effect of the vital rays, which is that of a chemical agent.

THE ACTION OF THE SKIN

The red and infra-red rays below 14,000 A.U. penetrate the skin and produce an immediate erythema which fades rapidly.[3] Those above 14,000 A.U. do not penetrate the skin, but if too intense may cause blistering. There is also a delayed erythema which does not appear for two or more hours. This is due to the shorter ultraviolet rays and may in all probability be a secondary reaction resulting from tissue injury, which, if it has been carried too far, may be accompanied by edema.

---

*Those interested in the spectrums of the different carbons, which vary from that of the white flame carbon to one as rich in ultraviolets as that obtained from the mercury arc lamp, can obtain such information either from the National Carbon Company or from the Bureau of Standards, through the publications of Coblentz, a fairly complete bibliography of which is published in his article in the Journal of American Medical Association for June 1, 1929, V. 92: 1834-1837.

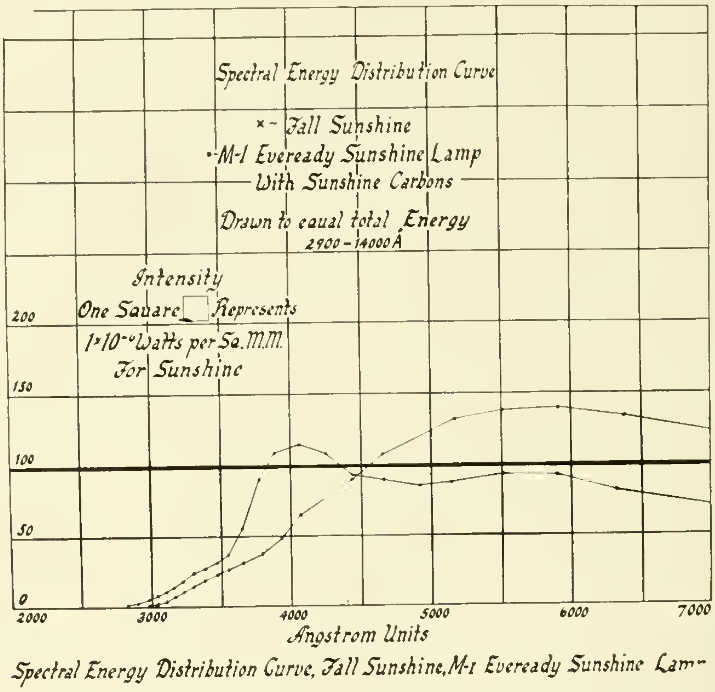


Fig. 4. Spectral energy distribution of "clinical sunshine" compared with that of an Everready carbon arc lamp as prepared by Greider and Downes.[4] It is claimed that while the relative amount of rays from about 2,900 to about 3,100 is some greater for the carbon arc lamp, than at 1 meter the absolute amount of this energy is essentialy equal to that in clinical sunshine.

Some claim that nature protects itself against this phenomenon through the formation of pigment or a tanning due to the deposit of melanin in the lower layers of the epidermis. Miescher[12] believes that the increase in the thickness of the stratum corneum, which occurs as a result of light is nature's protective mechanism. The type of pigment varies with the type of radiation used. That from the mercury arc utilizing the shorter radiations is yellowish brown and is not as permanent as that obtained from the rays of longer wave lengths such as the S-1 mercur arc lamp or the carbon arc or the sunlight. Th pigment from these latter sources is reddish o blackish-brown, depending upon the degree o the pigmentation. The exact effect and purpos of this phenomenon is not clearly understood. I

TABLE II. COMPARISON OF SUN AND MODEL M-1 SUNSHINE LAMP; ENERGY EXPRESSED IN WATTS × 10^{-7} PER SQ. MM.

	Anti-rachitic ultra-violet 2900-3100 A	Non-penetrating ultra-violet and visible 3100-6500 A	Penetrating red and near infra-red 6500-14000 A	Non-penetrating infra-red 14000-120,000 A	Total
Noon Fall Sunshine	1.4	3214	4045	1810	9070
M-1 Eveready Sunshine Lamp at 1 Meter Distance	1.7	458	620	780	1860
Percentage Distribution 2900-14000 A.					
Noon Fall Sunshine	0.019	44.3	55.6		7260
M-1 Eveready Sunshine Lamp	0.16	42.5	57.3		1080

addition to protecting the body against over-doses of ultraviolet rays, it may sensitize the skin so that more of the visible rays are absorbed. The rays between about 2,900 and about 3,200 A.U. produce an erythema and a dilatation of the capillaries, accompanied by a rich brown pigment. Uhlman[13] believes while the same wave length can produce both pigmentation and hyperemia hat pigmentation can be produced independently of hypermia, i.e., by radiation of a different wave ength than those which produce hyperemia. In pite of this the clinician must not ignore hyperemia in determining the effect of pigmentation. Rollier[14] and his followers believe that pigmentaion has a great deal to do with the success of the reatment and can be taken as an indication of extent of the healing. We have found in over nine years of experience with heliotherapy that he patients who are well tanned have generally made the most improvement. However, it is well known that patients who have failed to tan have occasionally recovered while those who have developed marked pigmentation have occasionally ailed to heal. Luckiesh[15] claims that tanning hould be taken as an indication of outdoor life ather than as a measure of health, and conversey that pallor is an indication of indoor life ather than of illness.

The normal physiological function of the skin eems to be increased in light therapy. Following n erythema dose of light there is a transitory ncreased resistance to staphlococcus, pneumococus and streptococcus infections. After pigmenation occurs this increased resistance to infecion is more permanent. Recent work by Eidinow nd Hill indicates that other wave lengths than he anti-rachitic ultraviolet may also play an important part in this phenomenon.[16] Tanned skin s soft and velvety and presents a marked conrast to the toneless, flabby, cold skin of the pale ndividual. The value of light therapy is inreased when it is supplemented by the tonic efect of moving air, which acts directly upon the asomotor system causing an alternate dilatation nd contraction of the skin capillaries. Under uch conditions there is an increase in the metaolic rate and mineral metabolism. There is a marked increase in muscular tone which acompanies the use of light therapy and may be in part due to this massaging effect of the moving air.

Cholesterol, which is found in large quantities in the skin, contains ergosterol as an impurity. This is activated chemically by the ultraviolet rays resulting in the formation of vitamin D. Thus part of the beneficial effects of light therapy is to be found in the results which are characteristic of vitamin D. The shorter ultraviolet rays from about 2,200 to about 2,700 A.U., which occur in artificial sources of light, possess great bactericidal properties but they are very irritating and destructive of protoplasm. It is possible also that the products resulting from such destruction may be harmful and that these shorter rays may therefore partially neutralize the effects of the longer rays, (about 2,700 to 3,100 A.U.). Therefore, Coblentz and Starr,[16] quoting Heilbron, Kamm and Morton, and Bills, Honeywell, and Cox, believe that the destructive properties of these short rays is great enough to destroy vitamin D, and so recommend that screens which filter out the ultraviolet rays below about 2,900 A.U. be used with all artificial sources of light. More recently Marshall and Knudson[17] have studied the formation of vitamin D at wave lengths of 2,536 A.U. and 2,800 A.U. They conclude that the formation of vitamin D is in direct proportion to the light quanta absorbed and is independent of the wave length. Therefore, if the time of exposure is so adjusted that the amount of light absorbed at the various wave lengths is the same, the same amount of vitamin D is formed. In any event, the period of treatment with the artificial sources of light containing these short rays is measured in seconds and minutes rather than in minutes and hours as is the treatment with sunlight.

THE PHYSIOLOGICAL EFFECT UPON THE BLOOD STREAM

The action of the reds and infra-reds below 14,000 A.U. and the violet and the near ultraviolet rays which penetrate the skin and are absorbed by the blood stream, is very complex. It is thought to be in part a photochemical[9] reaction which manifests itself locally and also on distant tissues and organs and for some time after radiation has ceased. When the light treatment is carried too far, its action is destructive rather than stimulative. The heat rays may increase the alkalinity of the blood and can raise the temperature of the blood 3° C. without disturbing bodily temperature. The calcium content of the blood is also increased due probably to the ultraviolet rays.

Basal metabolism is increased under light therapy, but the increase may be due mainly to the moving air. Due to the increased activity of the skin, elimination is increased, resulting in a reduction of blood urea nitrogen and an improvement in nutrition. There is a slight transitory lowering of blood pressure. The pulse rate shows an initial rise which subsequently drops to normal or below unless the treatment has been too prolonged. There is also an immediate rise in bodily temperature which drops to within one degree of normal or to normal shortly after the radiation has ceased.

INDICATIONS FOR HELIOTHERAPY

Light therapy is a popular but potent therapeutic agent which, unless carefully supervised, will do untold harm. It should not be considered as a cure-all nor is it nearly as effective when used alone as when combined with other accepted forms of treatment. In the words of Edgar Mayer[3], "to believe that sunlight or artificial sources of light will cure all forms of surgical tuberculosis, to be unduly optimistic about this treatment and to consider it a specific form of treatment, to use it without sound medical guidance and adequate equipment and finally to employ it to the exclusion of rest and hygenic regimen, eliminating orthopedic measures or the occasional necessary surgical intervention in bone and joint tuberculosis, is bound eventually to dishearten many sufferers and to bring discredit on an otherwise desirable method of treatment."

Whether artificial or natural light is indicated, will depend upon the season of the year, the condition of the atmosphere, the sources of light available as well as the type of lesion to be treated and the condition of the patient.

SEASON OF THE YEAR

In the temperate zone general solar radiation is indicated during the summer whenever it is available. Because climatic conditions make this impractical in winter and because window glass transmits only 1 to 2 per cent of the available rays at 3130 A.U., the advisability of using special window glass for indoor radiations is raised. As the winter sun is poor in ultraviolet rays, it is obvious that if such a glass is to have any value its transparency should be high. Therefore, in 1928, Coblentz[18] recommended that after complete solarization such glasses should transmit at least 25 per cent of the available rays at 3020 A.U. Due to more recent investigations[19] he now believes that a transmission of "45 to 50 per cent would be more nearly in agreement with physiological observations" and recommends that the minimum specifications of such glasses be raised to 35 per cent transparency at 3020 A.U. He adds very succinctly that when such a glass is needed the best is none too good and that one cannot afford to run the risk of using a glass of doubtful effectiveness. Dust may reduce the transmissibility of these glasses by 30 to 40 per cent.

Coblentz' and Starr's recent report[6] on the transmissibility of the various glasses marked prior to February 1, 1929, is very enlightening. They conclude that in thicknesses of 2.3 mm. these glasses may, after complete solarization, be divided into six groups according to their transmissive properties at 3020 A.U., as follows:

(a) Common window glass and quartzlite less than 1 per cent.

(b) Vitaglass, Sanalux and Renovic, about 25 per cent.

(c) Holviglass, Sunlit and Sendlinger's ultraviolet glass 35 to 40 per cent.

(d) Helioglass, Uviol-Jena, and Neuglas, 45 to 50 per cent.

(e) Corex-D glass 60 to 65 per cent.

(f) Corex-G981FF[2] and Quartz glass 80 to 90 per cent.

Because of the decrease in intensity in the ultraviolet rays in the wave lengths from about 2900 to about 3050 during the winter time, one cannot but wonder whether better results would not be obtained from artificial sources of light during these months than from the sun as it is transmitted through these special glasses.

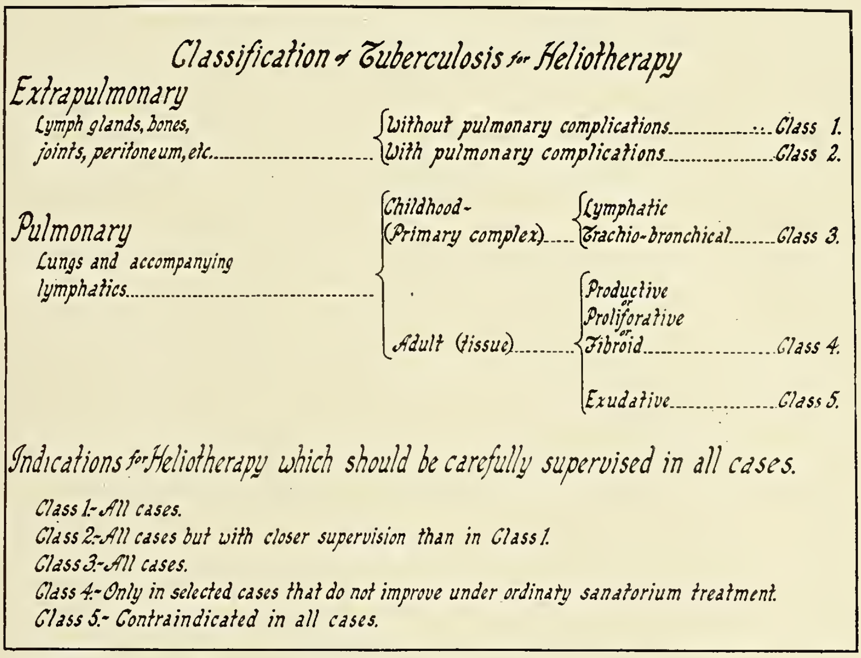
CONDITION OF THE ATMOSPHERE

Clear atmosphere transmits ultra-violet rays well, but fog, dust, and smoke interfere tremendously with their transmission. In general, more of the ultraviolet rays are available throughout a greater portion of the year in the tropics than they are anywhere else. In spite of this, due to atmosphere conditions Manila has a lower percentage (51) of the theoretical sunshine than Chicago (57) or New York (56) while Denver or Santa Fe has a still larger percentage (69 and

76 respectively).[7] This relationship varies, of course, with the season and with the year.

AVAILABLE SOURCES OF LIGHT

When sunlight is not available, some sort of artificial light is indicated. Because the spectrum of the quartz mercury arc differs so markedly from that of the sun, it is not the source of choice as a substitute for general sunlight irradiations. This type of artificial light should be reserved for those conditions where ultraviolet rays without heat are desired and for special conditions, such as superficial areas of tuberculosis or intestinal tuberculosis. The water cooled quartz light is indicated for local suppurating tuberculosis, draining sinuses, tuberculous otitis media, tuberculous laryngitis and allied conditions. As the spectrum of the S-1 lamp more closely approximates that of sunlight, it should have a wider range of usefulness than the quartz mercury arc. However, the bulb blackens with use and has to be replaced frequently. The spectrum of the carbon arc lamp with the corex-D filter and the white flame carbon, more closely resembles that of natural sunlight than that of any other artificial source of light. Moreover, it is always of the same intensity and does not deteriorate with use. Therefore, it is the artificial light of choice as a substitute for natural sunlight. When this source of light is used with a suitable fan to secure the proper circulation of air, the following criticism of Mayer's[20] concerning irradiation with artificial light loses much of its force: "Irradiations with artificial light as ordinarily employed indoors lacks some apparently important accompaniment of outdoor solar exposure, such as constantly moving fresh air with its affect produced through the skin and respiration and the uniform warming of the whole cutaneous surface with its production of a sense of stimulation followed by comfort, well-being and relaxation."


Classification of Tuberculosis for Heliotherapy
Extrapulmonary
Lymph glands, bones, joints, peritoneum, etc.
Without pulmonary complications ... Class 1.
With pulmonary complications ... Class 2.
Pulmonary
Lungs and accompanying lymphatics
Childhood- (Primary complex)
Lymphatic
Trachio-bronchial ... Class 3.
Adult (Tissue)
Productive or Proliforative or Fibroid ... Class 4.
Exudative ... Class 5.

Indications for Heliotherapy which should be carefully supervised in all cases.

Class 1:- All cases.
Class 2:- All cases but with closer supervision than in Class 1.
Class 3:- All cases.
Class 4:- Only in selected cases that do not improve under ordinary sanatorium treatment.
Class 5:- Contraindicated in all cases.

Fig. 5. Slight Modification of Watson's Classification. If the general rules of this classification are followed, much sorrow and many disappointments will be avoided.

TYPE OF LESION AND CONDITION OF PATIENT

The type of lesion and the condition of the patient will be discussed together. Figure 5 represents a slight modification of an outline of the indications for heliotherapy according to the type of tuberculosis as prepared by Watson. If the general rules of the outline are followed much harm and many disappointments will be avoided. Classes 1 and 2 include tuberculosis of the skin, the superficial glands, the bones and joints, the genito-urinary tract, the peritoneum, the intestinal tract, the middle ear, the larynx, the eyes, as well as the anus and the lower rectum. In outlining the indications for heliotherapy in extra-pulmonary tuberculosis, these two groups will be considered together as the pulmonary focus generally improves with the improvement in the extra-pulmonary lesion. Therefore, a pulmonary complication is an indication for closer supervision rather than a contraindication.

General body radiations in the sunlight in accordance with Rollier's schedule is indicated in all of these cases except the acute progressive type. This should be supplemented in the presence of ulcers, draining sinuses or fistulæ by the use of Thezac Porsmeur lens. This is a biconvex lens with a diameter of 12 inches and a focal point of 72 inches.[21]

When sunlight is not available, artificial light should be used. In certain instances, local applications of light from artificial sources are indicated in addition to general solar radiations.

Tuberculosis of the skin in this country does not present the same problem that it does in Europe. It is usually a local manifestation of a systemic disease and responds very well to heliotherapy. The artificial sources of light emitting rays of short radiations may be of special value in this particular type of tuberculosis.

In tuberculosis of the superficial lymph nodes, general body radiations in sunlight plus local X-ray treatments are indicated in all cases, even where softening and sinus formation is present. When sunlight is not available, artificial light is indicated.

Heliotherapy, combined with good orthopedic treatment, including orthopedic appliances and the judicious use of surgery in adults is indicated in bone and joint tuberculosis. Rollier reports excellent results in bone and joint tuberculosis with heliotherapy and the use of orthopedic appliances but without surgical intervention except in rare instances. His results, I believe, are due to a meticulous attention to the details of the treatment and to the fact that heliotherapy can be carried out over a longer period of the year at Leysin than it can in Minnesota. Petter believes[22] that such conservative treatment, that is, heliotherapy plus orthopedic appliances but without surgery should be limited to the early cases of joint tuberculosis where there has been no destruction of bone and no erosion of cartilage. In such cases, a functioning joint may be secured. When bone destruction has occurred, the time required for "a cure" with heliotherapy is greatly increased, and the possibility of a relapse in the case of a functioning joint is greater than with an ankylosed one. Both of these factors, that is, the length of treatment and the possibility of relapses are of prime importance to the patient and to the community which is supporting him during his period of convalescence. Hence, surgery, which will shorten the period of treatment and reduce the possibility of relapse through the production of an ankylosed joint, is indicated at the proper time. This, in most instances, is not as soon as a diagnosis is made, but is only after the process has become quiescent under the use of bed rest, orthopedic appliances and heliotherapy. In such instances surgery is not considered a cure-all, but rather a permanent splint which, by increasing the rest of the diseased part, protects and enhances the healing already secured. Postoperative convalescence can be materially reduced through the use of heliotherapy. Heliotherapy is valuable in the treatment of sinus and abscess formations.

In children, heliotherapy plus rest and good orthopedic sense will produce astonishing results. Surgery is to be used only as a last resort because it is so likely to interfere with the growth of the child.

In genito-urinary tuberculosis general solar therapy with artificial light therapy as a substitute is indicated, either as a curative, palliative or postoperative measure. As renal tuberculosis is considered to be a blood-borne metastatic infection, it would seem that it must be bilateral at first.[23]. In unilateral renal tuberculosis, then, the process must have healed in one kidney while it progressed in the other. Thomas and Kinsella, as a result of a study of genito-urinary tuberculosis carried on at Glen Lake Sanatorium over a period of years, believe that early renal tuberculosis heals. This is in accordance with the conclusions of Medlar[26] as a result of a study of 100,000 microscopic sections of the kidney. In such cases, heliotherapy combined with rest and other factors of sanatorium regimen is the treatment of choice; however, when unilateral renal tuberculosis has gone far enough to produce an ulceration into the kidney pelvis which can be demonstrated on a pyelogram, or to definitely impair the function of the kidney, a nephrectomy is indicated.[24, 25] In such cases heliotherapy is indicated to prepare the patient for the operation and is the postoperative treatment of choice. In bilateral renal tuberculosis, surgery is contraindicated except in certain selected cases when it is to be used as a palliative measure. In such cases heliotherapy is indicated, and in many instances excellent clinical results are reported, including even the disappearance of tubercle bacilli from the urine. It is rather commonly believed, however, that sooner or later these lesions will relapse.

Genital tuberculosis is usually secondary to a renal infection, although occasionally it is apparently a blood-borne infection from some other focus than the kidney. Therefore, in all cases of genital tuberculosis a thorough search should be made for a renal focus, and when found, this should be removed. Heliotherapy is indicated in all cases of epididymitis and in the early cases, may be sufficient to produce a cure. When it does not, an epididymectomy is indicated. With the urinary focus removed and the external evidence of genital tuberculosis properly treated, the lesion in the bladder, the prostate or seminal vesicle usually heals promptly under heliotherapy.

Sunlight therapy combined with local applications of artificial light is indicated in tuberculosis of the intestinal tract. Here the influence of light upon the absorption of calcium from the intestinal tract seems to have a direct bearing upon the cure of the intestinal tuberculosis.

Tuberculosis of the peritoneum is usually a secondary manifestation of a tuberculous lesion in the abdominal cavity. General solar irradiation with artificial light therapy as a substitute is indicated in this type of tuberculosis. Under such treatment there is often a marked reduction in symptoms and local signs resulting in a clinical cure. When the original focus happens to be a fallopian tube or an appendix there is much less possibility of a future relapse if these organs are removed than if they are not. So in certain conditions, heliotherapy should be supplemented by surgery.

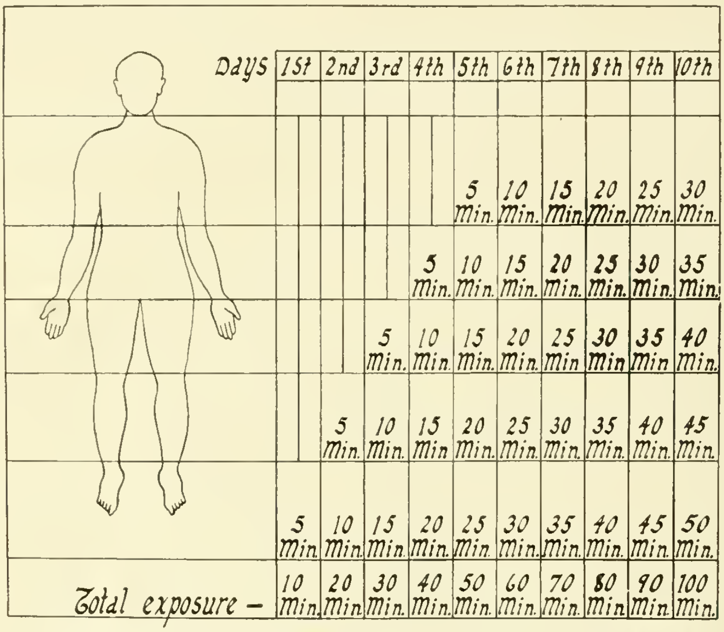
General body radiations of natural sunlight are indicated in tuberculosis of the ear, the eyes, the larynx, as well as ulcerations of the anus and lower rectum, supplemented, except in tuberculosis of the eye, by local application of the water-cooled quartz mercury vapor lamp. Heliotherapy under such conditions, combined with the other forms of sanatorium treatment, including surgery in connection with ulceration of the anus and perirectal abscess and fistula in ano, gives excellent therapeutic results.[27, 28]

In Class 3, general solar radiations supplemented by artificial light for use in cloudy weather and when natural sunlight is not available give excellent clinical results. Because the acute phase of this particular type of tuberculosis usually clears up rather promptly, nothing is to be gained in the use of heliotherapy until it has quieted down. Heliotherapy properly carried out will give the child the maximum assurance against further disability from tuberculous disease.

Class 4. LoGrasso[29] believes that even cases of adult tuberculosis with moderate fever are suitable for heliotherapy. In our experience it would seem better to postpone heliotherapy in such cases until strict bed rest over a prolonged period of time has failed to produce the desired results. Many patients who cannot tolerate natural heliotherapy in the beginning, can do so after a course of artificial light therapy.

When there is no fever present, general body radiation in the sunlight, either supplemented by or preceded by radiations from artificial light is indicated in selected cases. When such cases are properly selected and heliotherapy properly supervised, hemoptysis, miliary tuberculosis and pulmonary spreads are not encountered any more often than under ordinary sanatorium treatment. When a special therapeutic agent is used and spreads are encountered, one is apt to attribute the spread to the therapeutic agent and forget that tuberculosis is a relapsing disease and that there will be a certain proportion of relapses no matter what type of treatment is used. In general, the most suitable cases for heliotherapy in Class 4 are those which have become stationary under the ordinary forms of sanatorium treatment and which still have a fairly large amount of tuberculous pathology. The aim of heliotherapy in such cases is, of course, to clear up as much of the pathological picture as possible in order to reduce the possibility of future relapses. I can see no indication for heliotherapy in Class 4 when the patient is progressing satisfactorily under the ordinary forms of sanatorium treatment.

Tuberculous pleurisy with effusion, while it is usually due to an underlying pulmonary focus, often clears with the aid of heliotherapy. Therefore, every case of tuberculous pleurisy with effusion, unless accompanied by the exudative type of tuberculosis, should have heliotherapy. This measure is very effective in the prevention and even in the treatment of a tuberculous empyema.



Days	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
					5 Min.	10 Min.	15 Min.	20 Min.	25 Min.	30 Min.
				5 Min.	10 Min.	15 Min.	20 Min.	25 Min.	30 Min.	35 Min.
			5 Min.	10 Min	15 Min.	20 Min.	25 Min	30 Min	35 Min	40 Min.
		5 Min.	10 Min.	15 Min	20 Min.	25 Min.	30 Min.	35 Min.	40 Min.	45 Min.
	5 Min	10 Min.	15 Min.	20 Min.	25 Min.	30 Min.	35 Min.	40 Min.	45 Min.	50 Min.
Total exposure –	10 Min.	20 Min.	30 Min.	40 Min.	50 Min.	60 Min.	70 Min.	80 Min.	90 Min.	100 Min.

From the 10th to the 15th day, increase according to same scale. From the 15th day, all the previously exposed portions of the body should receive the same amount of insolation as the longest exposed part,—increasing the time 5 minutes daily, till a bath of from 3 to 4 hours is taken.

Fig. 6. Rollier's Schedule of Sun Dose. This is not a hard and fast schedule but it is the standard upon which individualization is based. The "total exposure" means total for each exposure front and back and is usually repeated three times a day.

In our opinion, heliotherapy is contraindicated in Group 5. There may be exceptions to this rule in very selected cases, but as a general proposition no one in Class 5 should receive heliotherapy. Many patients who were originally in Class 5 will, under ordinary sanatorium treatment, improve and progress to Class 4. Under such conditions and when the process becomes stationary, heliotherapy may be indicated to increase the extent of the pathological improvement.

TECHNIC

In discussing the general technic of the sun-bath, Rollier[30] states "the importance of carefully dosing the amount of exposure to sunlight permitted to each patient could hardly be overemphasized, as there are few other methods of treatment in which dosage and careful individualization are of greater importance. It would hardly be an exaggeration to say that it is on the initial period, that of acclimatization and adaption, that the eventual success of the treatment depends. The manner in which the patient reacts to sunlight, and following from this the amount of insolation it will be advisable to give him, are the fundamental points in heliotherapy."

Therefore, before heliotherapy is given, each patient must have become acclimated to his new environment and must have been thoroughly studied by the physician. Perhaps in no other field of tuberculosis therapy will undue haste often spoil an otherwise favorable prognosis. In all instances, the heliotherapist must individualize, as it is obvious that one with only a small localized focus of extra-pulmonary tuberculosis and in excellent general health need not be treated in the same manner and degree as a person with several foci and fever, and whose general condition is not so good. Rollier's arbitrary plan of dosage is outlined in Figure 6. The general technic of the sun-bath as advocated by Rollier is given in complete detail in his excellent book, "Heliotherapy,"[31] therefore it will not be repeated in this summary. In brief, his plan is to divide the body into five zones. The time of exposure is gradually increased as well as the zone till the entire body, with the exception of the head, is receiving a total of two to four hours' radiation a day. The maximum amount of radiation will vary with the atmospheric conditions, the individual patient, and the individual therapist. Some physicians advocate a single exposure of from two to four hours a day, while others prefer to have the period of irradiation broken into exposures of fifteen to thirty minutes front and back, followed by a short rest of fifteen to thirty minutes or more. This procedure is repeated as often as is necessary to secure the desired number of minutes exposure for that day.

In planning solar radiations one should bear in mind that the ultra-violet intensity of the sun's rays is greatest from 10 A. M. to 2 P. M., decreasing to an imperceptible value at sunrise and sunset and in cloudy weather. However, the heat of the day may make long exposures during that period inadvisable and then one is forced to choose between giving solar radiations at less desirable times of the day or of decreasing the time of exposure. If other hours of the day are selected, the patient will, at least, receive the benefit of moving air and heat, with the well known effect of this combination upon general body metabolism and function. By combining short periods from both the best time of day and less desirable times, a longer period of solar radiation may be obtained with greater benefit to the patient.

Our maximum exposure for the average patient during the summer of 1930 was two hours per day, either from 10 A. M. to 2 P. M., or one hour in that period and one hour earlier in the morning, depending upon the manner in which the patient reacted to light. The maximum exposure at one time was a half hour front and back, followed by a rest of at least a half hour.

Immediately after an exposure to the sun, there is generally an increase in bodily temperature which, if it is due to the normal physiological effect of heat, will drop to almost normal within a half hour after the treatment has been terminated. If it does not, then the dose of light should be reduced. We have had patients who could only take one minute of solar exposure at the beginning of treatment, but who gradually became acclimated to the sun's rays and could tolerate large doses of heliotherapy and finally progressed favorably. The pulse rate is likewise elevated after radiations but it too should fall to approximately normal within a half hour after exposures have been terminated. Thus the body temperature and pulse reaction plus the general condition of the patient serve as important checks on the progress of the treatment. Therefore, it is necessary that they should have been observed for some time before treatment is commenced in order to determine the individual normal.

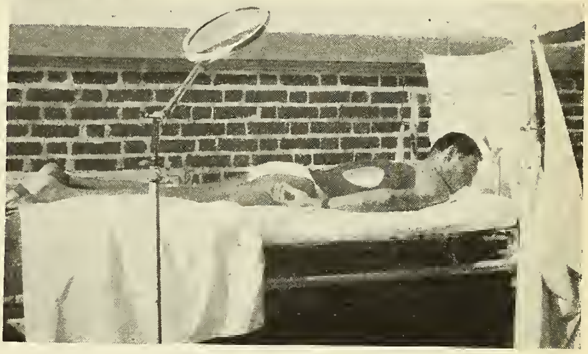


Fig. 7. Thezac Porsmeur lens.

The technic for the use of the Thezac Porsmeur lens in general is as follows: The lens is focused over the site of the lesion so as to obtain a circle of light not less than seven inches in diameter. The treatment is usually started at five minutes and is gradually increased till a maximum of thirty minutes is reached. This may be repeated once during the day if desired.[21] Here also individualization is necessary and the exact size of the circle, the initial period of treatment, the rate of increase and the maximum time of treatment are a matter of trial and judgment. They will vary with the lesion, the condition of the patient and the therapist (Fig. 7).

DOSAGE OF LIGHT

The dosage of light varies with the skin reactions desired. Some heliotherapists prefer an erythema only; others an erythema and a pigmentation. Rollier[32] believes that a fairly close parallelism exists between pigmentation and a favorable prognosis. We prefer a ruddy erythema with a tan bordering on a mahogany rather than a chocolate brown. Eidinow and Hill, as reported by Mayer,[3] aim at a mild erythema reaction with each dose applied. To secure this they use a source of light with a great intensity of ultraviolet energy and avoid overheating the body by using short and intense exposures. When desquamation of skin occurs, treatments are interrupted until it ceases. When the skin no longer reacts to the mercury quartz light, the long flame carbon arc is used, later changing to carbons impregnated by various metals. Their method requires only fifteen minutes maximum radiation front and back in contrast to the Finsen method where a two hour exposure of artificial light is the rule.

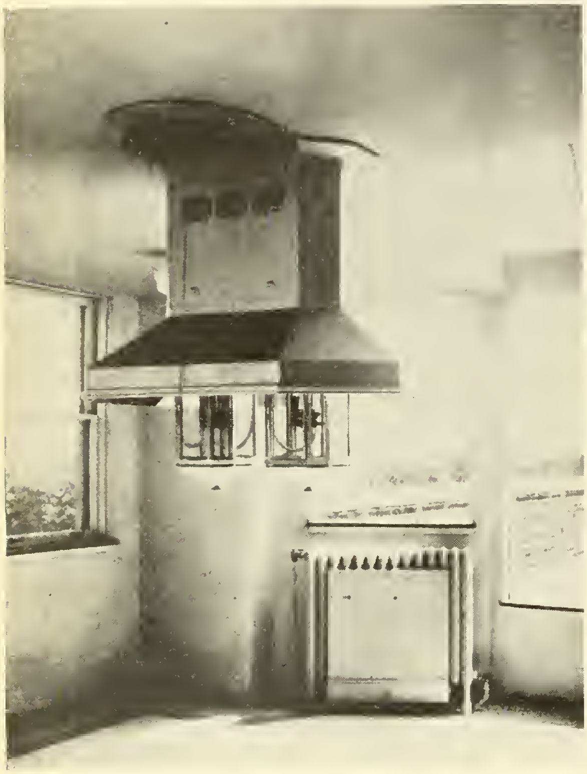


Fig. 8. 60 Ampere Twin Arch Carbon Arc lamp with the Corex-D filter used by Dr. Bosworth.

With a new air-cooled quartz mercury light, Mayer[3] on a purely emperical basis begins with a three minute exposure at a distance of thirty-six inches from the body. He applies two exposures in front and two behind and a fifth one over the area of disease. Exposures are increased by one minute a day until twenty minutes over each area "front and back on all five parts is given." This makes a total exposure of 100 or more minutes. When the twenty minute period over each area is reached, the quartz burner is then lowered about one inch every day until it is eighteen inches from the skin. As the lamp ages the length of the exposures can be increased. The room temperature is maintained at about 70° F. and moving air provided by means of proper ventilation. When necessary, heat is added. In addition to general body exposures with the air-cooled mercury vapor light, local applications of the water-cooled mercury vapor light are used in superficial forms of tuberculosis.

Because of a large number of patients to be treated, we ray the entire body at one exposure progressing in the manner outlined by Mayer, thus reducing the time required for a treatment of each patient from 100 minutes to forty minutes. This enables a larger number of patients to be treated per lamp per day than the other method.

The technic in the use of the water-cooled quartz mercury lamp varies also with the lesion to be treated and the therapist. Some physicians prefer to radiate patients every day with very small doses while others use larger doses and only radiate once or twice a week. The results obtained with either method are about the same. In general, the exposure with this lamp is measured in seconds as compared with minutes for the air-cooled lamp.

The Finsen group using the carbon arc begin with a fifteen minute radiation, front and back, and then increase the radiation fifteen minutes per day front and back until exposures of two hours daily are reached. The distance from the lamp varies with the heat tolerance of the individual. The treatment is frequently accompanied by sweating and is often terminated with a sponge bath. Additional local exposures are made when possible. When carbons are impregnated by various metals, different types of rays are emitted and the amount of radiation used depends upon the skin erythema desired and the general constitutional reaction of the patient to light therapy. With a 90 ampere Schwartz carbon arc light, beginning exposures are usually limited to half a minute with perhaps the maximum exposure of thirty minutes.[3] With the 60 ampere Eveready carbon arc lamp with a Corex-D filter (Fig. 8) and at a distance of 55 to 68 inches from the patient, Bosworth[33] recommends that the body be zoned as it is for solar radiations and that exposures be gradually increased as they are under light therapy. However, when the chest has been exposed five minutes, he then recommends that general body radiation be limited to five minutes, front and back, increasing five minutes a day front and back until thirty minutes exposure anterior and posterior have been reached.

It is understood that these are merely suggestions for the technic of the ordinary exposures and that each patient represents an individual problem. An over-exposure to either sunlight or artificial light will result in tissue injury rather than in stimulation. This injurious reaction is usually manifested by cutaneous reactions such as blistering, intense burning and systemic reactions, such as fatigue and an increase in the pulse and temperature rate which persists. This last reaction is probably due to an intense focal reaction similar to the focal reaction produced from an over-dose of tuberculin. Therefore, great care must be exercised to see that the individual does not receive a greater amount of radiation than he can tolerate. In some instances it may be advisable to radiate the patient every day but to reduce the length of exposure, and in others to radiate the patient only every other day. In all instances, individualization is necessary and the physician is to be guided chiefly by the skin reaction and the general reaction of the patient to light therapy.

RESULTS

After nine years experience in heliotherapy, both natural and artificial, we agree with those who believe that where general body radiations are indicated, the best results will be obtained from natural sunlight. We have had ample opportunity to observe that in the fall, at the end of a summer's sun, our patients are in much better condition than they are in the following spring after several months of quartz mercury radiation. This, of course, is to be expected because as Coblentz[8] states, "physically there is no comparison between this type of radiation and that of the sun and it is hardly to be expected that these two sources of light will give the same results in all types of treatment." As the white flame carbon arc with a Corex-D filter emits a source of light which is more like sunlight than that obtained from any other artificial source, it is natural to expect the results from this type of lamp to be more similar to those obtained from sunlight than those obtained from any other type of artificial light.

The results to be expected in groups 1 and 2 vary, of course, with the type, extent and severity of the extra-pulmonary lesions and the pulmonary complications. Excellent results with natural and artificial heliotherapy, using both general and local radiations, have been obtained in tuberculosis of the skin. Tuberculosis of the superficial glands, as a rule, responds very well to general and local radiations with sun and artificial sources of light. Local X-ray treatments increase fibrosis and reduce the period of treatment.

In very early cases of bone and joint tuberculosis, before bone destruction or erosion of cartilage has occurred, good results can be obtained from heliotherapy plus good orthopedic sense, if the treatment is continued long enough. Many of such patients will have a functioning joint. If the process has gone on to bone destruction or erosion of the cartilage, a more permanent result can be obtained as well as the length of treatment reduced if surgery is added at the proper time. In such cases an ankylosed joint results.

In extremely early cases of renal tuberculosis, before the lesion has ulcerated into the pelvis, or the function of the kidney impaired, good results may be obtained with heliotherapy combined with bed rest. In unilateral lesions where there is ulceration into the kidney pelvis, heliotherapy, before and after nephrectomy, combined with bed rest will improve the results. In bilateral cases of renal tuberculosis, heliotherapy is only palliative but often produces surprisingly good clinical results, even including the disappearance of tubercle bacilli from the urine. Sooner or later most of these patients relapse. Genital tuberculosis is usually secondary to a renal infection although it can occur without it. When the renal focus is removed and the external evidence of genital tuberculosis, such as epididymitis is properly treated, including the use of heliotherapy, the lesions in the bladder, prostate and seminal vesicle usually heal rather promptly under heliotherapy, plus other factors of sanatorium regimen.

Tuberculosis of the peritoneum does unusually well under heliotherapy. When the focus is removed later, there is very little possibility of recurrence of the disease.

Intestinal tuberculosis does very well under general heliotherapy supplemented by local applications with the air-cooled mercury lamp and a suitable diet. Whether carbon arc lamps with a Corex-D filter will prove more valuable in this type of lesion or not can only be determined through more study.

Tuberculosis of the middle ear and the larynx give excellent results under general solar radiations plus local radiations with the water-cooled quartz mercury light.

Tuberculosis of the anus and lower rectum give good results when general solar radiations are combined with adequate surgery at the proper time.

In pulmonary tuberculosis, group 3, the results to be obtained from natural and artificial sources of sunlight using general body radiations are excellent and surpass those obtained in any other form of treatment.

In group 4 the results in selected cases with properly supervised heliotherapy, both natural and artificial, are good. We have been very fortunate in having many cases go on to more complete fibrosis under this type of treatment than when the ordinary sanatorium treatment was used.

As heliotherapy is contra-indicated in group 5, only poor results can be expected.

Appreciation is due Dr. Wilhelm Strenstrom, Associate Professor of Biophysics, University of Minnesota, Minneapolis, for valuable criticism of that portion of this article which deals with the physical characteristics and physiological effects of light.

BIBLIOGRAPHY

1. McCollum and Simonds: Newer knowledge of nutrition. 4th edition, New York, Macmillan and Company, 1929, p. 333.
2. Luckiesh, M.: Artificial sunlight. Van Nostrand and Co., Inc., New York, p. 61, 1930.
3. Mayer, Edgar: The fundamentals and clinical aspects of light treatment with special relation to tuberculosis. Jour. Am. Med. Assn., 89:361 (July 30), 1927.
4. Greider and Downes: Physical characteristics of sunshine and its substitutes. Presented before Illum. Eng. Soc., 1930.
5. Coblentz, W. W.: A comparison of the ultra-violet component radiation from the carbon arc and mercury arc lamps and from the sun. Am. Jour. of Electroth. and Radiol., 43:445 (Dec.), 1925.
6. Coblentz and Stair: Data on ultra-violet radiation and the solarization of window materials. Research paper No. 113, Bureau of Standards, Res. Jour., Vol. 3 (Nov.), 1929.
7. Mayer, Edgar: Clinical application of sunlight and artificial radiation. Williams and Williams, Baltimore, 1926, p. 188.
8. Coblentz, W. W.: Sources of ultra-violet radiations and their physical characteristics. Jour. Am. Med. Assn., 92:1834 (June 1), 1929.
9. Coblentz, Dorcas and Hughes: Radiometric measurements on the carbon arc and other sources used in phototherapy. Jour. Am. Med. Assn., 88:390 (Feb. 4), 1927.
10. Coblentz, W. W.: Sources of ultra-violet radiations and their physical characteristics. Jour. Am. Med. Assn., 95:411 (Aug. 9), 1930.
11. Dorcas, M. J.: Research Department, National Carbon Company. Personal Communication.
12. Miescher, G.: Das Problem des Lichlschutzes und der lichtgewohung Strahlentherapie, 35:403, 1930.
13. Uhlman, E.: Über die Abbangigkeit der Pigmentbildung von der Wellenlänge der Strahlung. Strahlentherapie, 35:361, 1930.
14. Rollier, A.: Heliotherapy. Oxford Medical Publications, London, p. 205, 1923.
15. See reference No. 2, p. 58.
16. Eidinow and Hill: Protection afforded by short infra-reds and red rays to lethal dose of Staphylococcus. Brit. Med. Jour., 1:388 (March 1), 1930.
17. Marshall and Knudson: Formation of V-D by monochromatic light. Jour. Am. Chem. Soc., 52:2304 (June), 1930.
18. Coblentz, W. W.: Summary data on the transmissibility of ultra-violet radiation through glasses and glass substitutes used for therapeutic properties. Trans. Nat. Tub., p. 71, 1928.
19. Coblentz, W. W.: Ultra-violet transmission glasses. Jour. Am. Med. Assn., 95:864 (Sept. 20), 1930.
20. See Reference No. 7, p. 318.
21. Bendis, J. Harry: Heliotherapy, Minn. Med., 5:203 (May), 1922.
22. Petter, C. K.: Present status of heliotherapy in tuberculosis. Ann. Int. Med., 4:1452 (May), 1931.
23. Thomas and Boquist: The diagnosis of renal tuberculosis. Trans. Nat. Tub. Assn., p. 178, 1925.
24. Thomas and Kinsella: Renal tuberculosis. A preliminary report of a clinical research problem. Jour. Urol., 17:395 (Apr.), 1927.
25. Thomas and Kinsella: Some data concerning the clinical course of renal tuberculosis. Jour. Urol., 19:95 (Feb.), 1928.
26. See Reference No. 7, p. 223.
27. Fansler and Petter: Rectal fistulæ in the tuberculous. Minn. Med., 10:698 (Nov.), 1927.
28. Petter and Fansler: Tuberculosis of the anus and rectum. Minn. Med., 14:622 (July), 1931.
29. See Reference No. 7, p. 207.
30. See Reference No. 14, p. 18.
31. See Reference No. 14, p. 21.
32. See Reference No. 14, p. 205.
33. Bosworth, Robinson: Personal communication.

IMPAIRMENT OF VISION FOLLOWING HEAD INJURY*

ARTHUR EDWARD SMITH, M.D., F.A.C.S.
Minneapolis

A NUMBER of factors have combined, during the past two decades, to bring about a considerable increase in the relative number of traumatic cases encountered in surgical practice.

Modern industry provides its share of these, and traffic hazards, since the advent of the automobile, have greatly increased the incidence of injuries, and given rise to a relative as well as an actual increase in the number of traumatisms involving the head. About 75 per cent of individuals who have sustained head injuries of any consequence complain afterward of visual disturbances. These may comprise anything from a slight, transient obscuration of sight to complete blindness.

Naturally these sequelæ frequently form the basis for claims for compensation or damages. It devolves upon the examining surgeon to determine the exact nature and extent of the loss of visual function, to decide whether the existing impairment is due in part or entirely to the particular injury in question, and to exclude malingering.

Injury to the visual mechanism manifests itself in various ways. Thus we may encounter in these patients:

1. Impairment of central vision.
2. Defects in the peripheral fields of vision.
3. Impairment or loss of function of the cortical centers or association fibers, causing conceptual blindness (mind blindness or object blindness) in which the patient can see objects, but fails to recognize them for what they are.
4. Loss of ability to distinguish colors.
5. Motor derangements, including ptosis, paralysis of the extrinsic ocular muscles, interference with the normal pupillary reactions, loss of accommodative power, impairment of conjugate ocular movements, etc.
6. Nystagmus.
7. Purely psychic affections of the sight, such as occur in hysteria, traumatic neurasthenia, etc.

In the trial of cases involving litigation over the alleged effects of head injuries great stress is always laid upon the presence or absence of demonstrable skull fracture, although it is an obvious and well known fact that this is altogether secondary in importance to the question of the nature and extent of the injury to the brain. Extensive fracture of the skull may be present in cases in which there are no subsequent evidences of any brain trauma of consequence, and there are, of course, many cases of serious, and even fatal, injury in which there has been no loss of osseous continuity. For instance, those cases of fatal head trauma in which the only autopsy findings are multiple punctate hemorrhages into the deeper structures of the brain, seem to be observed only in the absence of skull fracture.

Much of the experimental work which has been done in an attempt to work out the physics and mechanics of head injuries has been without very significant results. This is natural in view of the fact that in cadavers (which can rarely be examined in the fresh condition) the rigidity and inertness, the muscular atony, absence of circulation and deflux of the cerebrospinal fluid give rise to physical and mechanical conditions which are quite different from those which exist in the living subject. However, some of the studies along this line, such as the experiments of Felizet on the elasticity of the cranium, the work of Coppez on the mechanism of chiasmal injuries, etc., have been of definite value.

Because of the structural characteristics of the skull, a vault affording almost complete bone continuity, with closed sutures and with a base weakened by many openings for nerves and blood vessels, in blows or falls upon the vertex of the head, the force naturally tends to be transmitted to the base. This frequently causes a basal fracture with or without a coincident fracture of the vault.

The anatomical relationship of the optic nerves, chiasm, optic tracts and nuclear centers with the skull base, especially in the region of the middle fossa, explains the frequency with which these basal fractures are followed by disturbances of vision.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 6, 1931.

The force of blunt traumatism to the skull, from any angle, tends to pass around in radiating directions, causing cracks with varying degrees of separation of the bone. These cracks naturally tend to follow the weaker structures lying between the bony buttresses, and hence to involve the fossæ.

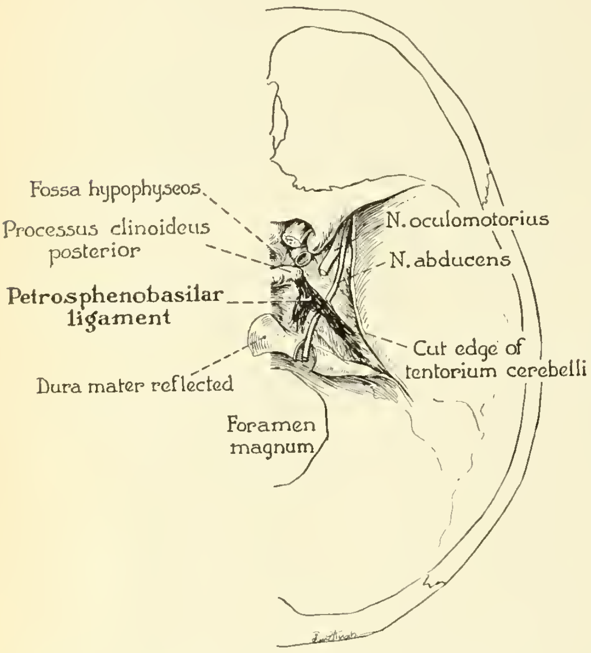

Fossa hypophyseos
Processus clinoideus posterior
Petrosphenobasilar ligament
Dura mater reflected
Foramen magnum
N. oculomotorius
N. abducens
Cut edge of tentorium cerebelli

Fig. 1. Dissection showing relationship of abducens nerve to petro-spheno-basilar ligament.

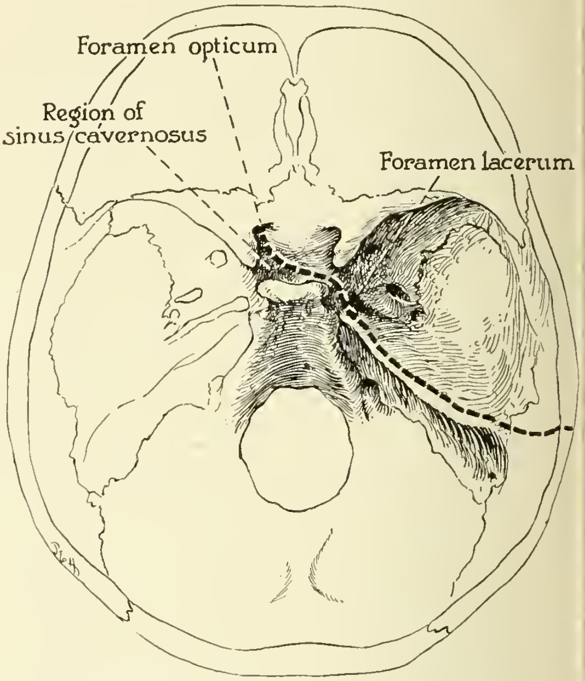


Fig. 2. Ajello's case of fracture of the right middle fossa extending into the optic foramen of the opposite side.

Fractures which irradiate from the parietotemporal region to the corresponding middle fossa are much the most frequent of all fractures extending to the base. This is due to the extreme thinness of the bone in this part, and to the fact that at this point is found the greatest distance between the two nearest reinforcements—the orbito-sphenoidal pilaster in front and the pilaster of the petrosa and mastoid tuberosity behind.

In fractures of the middle fossa, particularly those which injure its posterior portion, the pyramid formed by the petrosa is almost always involved. The line of fracture usually follows a course parallel to the axis of the pyramid. The inelasticity of the pyramid, the numerous canals which traverse it, and its oblique median slant make this region particularly vulnerable. In fractures parallel to the axis of the pyramid the apex is almost always involved, especially when the bone is sharpened into a simple apophyseal lancet or, as in some cases, is joined to the petrosa by a small osseous pedicle.

Due to the firm attachment of the petrosphenobasilar ligament (which connects the apex of the petrosa to the dorsum of the sella and to the basilar process of the occipital bone), the apex is not able to take part in the rotation of the pyramid, a condition liable to occur in traumatisms of the median fossa. The anatomy of Dorello's canal is of interest in this connection. Vail says, "Between the spina sphenoidalis and the processus clinoideus posticus there is a sinus with its concavity directed superiorly and laterally. It is bridged over by the petro-spheno-basilar ligament. In this space lie the abducens nerve and the inferior petrosal sinus where it empties into the cavernous sinus. The abducens lies in the lower boundary of this area, often being confined to the angle which the spina sphenoidalis makes with the upper margin of the pyramid of the petrous bone, which at this point is somewhat flattened from above. After leaving Dorello's canal the abducens makes a slight bend and enters the cavernous sinus, where it now lies in near relationship to the carotid artery."

The trunk of the abducens nerve (Fig. 1), passing beneath the ligament and in close contact with the bone, is almost always injured in fracures in this region. This gives rise to one of he most frequently encountered traumatic eripheral paralyses in basal fractures—that of he external rectus.

In most fractures extending into the petrous ortion the apex is found to be broken and seprated from the rest of the bone for about 3 mm. istance. This corresponds precisely with the ength of the fixed portion of the petro-sphenoasilar ligament.

The majority of fractures of the middle fossa erminate in the foramina of the same side. It ust, however, be remembered that they someimes reach the optic foramen on the opposite ide. Ajello cites a case of fracture of the right edian fossa extending completely across the ength of the pyramid bordering its upper marin and passing obliquely into the corresponding oramen lacerum. From here the fracture scended the internal face of the cavernous sinus nd ran across the sella into the optic foramen f the opposite side (Fig. 2).

The extent of fractures of this kind is someimes overlooked at autopsy if the whole base f the cranium is not completely denuded of the ura, which is closely adherent to the subjacent one, often concealing slight and incomplete lines f fracture.

In basal fracture there is frequent participaion of the walls of the orbit. Of eighty-six cases Von Holder found seventy-three in which the rbit was involved. The majority of orbital fracures extend into the optic canal and foramen. The anatomical relationship of the optic nerve with the foramen and canal is such that the nerve s almost inevitably injured. The meninges of he brain here form three concentric sheaths round the nerve. The inner sheaths are deliate and easily lacerated; the external (dural) sheath adheres very closely to the periosteum of the foramen and the canal, especially to the pper and internal walls, which are very fragile. The spaces bounded by the three sheaths surrounding the nerve are closed anteriorly, but ommunicate directly with the subdural and subarachnoidal spaces of the brain posteriorly, making possible the violent penetration of the endocranial fluid in severe injuries of the head. This explains the microscopic findings, since the penetration of the cerebrospinal fluid, besides causing expansive elevation of the sheath of the nerve and rupture of its trabecular network, gives rise to separation, contusion and laceration of the nerve elements and disorientation of their molecular relationship. In extravasation of blood into these spaces, the source of the hemorrhage may be the subdural cranial space, the ophthalmic artery or its branch, the central artery of the retina either before or after it enters the nerve about 12 mm. from the eyeball.

In Miceli's case, in which the patient died of pneumonia about six weeks after the injury, (fracture involving the right optic canal), macroscopic examination showed the optic nerve to be thickened in the form of a club with the most swollen part toward the anterior extremity. Microscopically there was increase in the intervaginal space, more marked toward the distal end. In the vicinity of the lamina cribrosa the nerve fibers were tightly packed although in the tracts small vacuoles of varied form were interposed. There were ovoid lacunæ, lined with endothelium only from the side of the arachnoid. Some of these lacunæ penetrated like a fissure into the dural sheath.

The mechanism of injury to the optic chiasm is of particular interest. That cranial traumatisms so often fail to affect the chiasm is due to the latter's being so placed that it is seldom touched by the lines of fracture or splinters of bone.

The chiasm does not rest upon a bony surface but is encased in an arachnoid covering and situated above the anterior part of the tentorium of the hypophysis. It does not have direct connection with the diaphragm of the pituitary body, from which it is separated by the cisterna basalis of the subarachnoid space. This intervening space varies from 4 to 10 mm.

Hence, the line of fracture, even if it passes through the sphenoid body and optic groove, does not touch the chiasm (Fig. 3). Radiograms do not show bony splinters in this region nor have they been found at autopsy. It is probable that hemorrhage seldom exerts enough pressure on the chiasm to destroy the function of the crossed visual fibers.

Certain types of fracture are particularly liable to be associated with injuries of the chiasm. These are fronto-sphenoidal fracture, anterolateral fracture with depression of the external orbital wall, and petro-occipital fractures extending to the spheno-petrosal suture.

The fronto-sphenoidal fracture is especially common in automobile injuries and is usually the result of violence to the frontal region. As a rule, in these cases, the optic nerve is injured at the canal, causing a more or less complete monocular blindness promptly followed by atrophy; occasionally, however, a bitemporal hemianopsia is observed. The mechanism of the production of these hemianopsias is apparent.

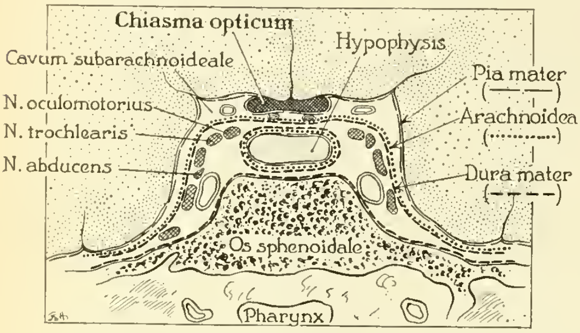


Fig. 3. Relationship of chiasm to hypophysis and os sphenoidale.

In his experiments on the elasticity of the cranium, Felizet has shown that antero-posterior blows may increase the transverse diameter as much as 8 millimeters without fracture occurring. In more severe traumatisms, which would inevitably be followed by fracture, the transverse "spread" is still greater. The ethmoid is depressed from front to back and is fractured in the same direction. The two optic canals are thus violently separated from each other, pulling away with them the optic nerves (Fig. 4). Coppez has demonstrated that the vulnerable points of the chiasm are the anterior angles at the attachments of the optic stalks. The nerve is firmly adherent to the walls of the optic canal and, if the traction induced by the "spread" is sufficient, the chiasm suffers a saggital laceration which is, of course, followed by a bi-temporal hemianopsia. If some of the bundles of crossed fibers have been preserved there will be small areas in the temporal fields where vision will be intact. The macula is not, as a rule, involved and central vision usually remains unaltered.

The second type of fracture referred to above; *i.e.*, antero-lateral fracture with depression of the external orbital wall, is one frequently observed following automobile injuries in which a wheel has run over the head. In these cases, if the nerve is torn at the anterior orifice of the canal on the same side as the injury, there is a simple loss of sight in the one eye. If, however, there should be an extensive fracture of the canal, the tearing away of the nerve takes place farther back at the angle of the chiasm, adding a loss of function of the temporal field in the other eye to whatever damage may have been done to the eye on the side of the injury.

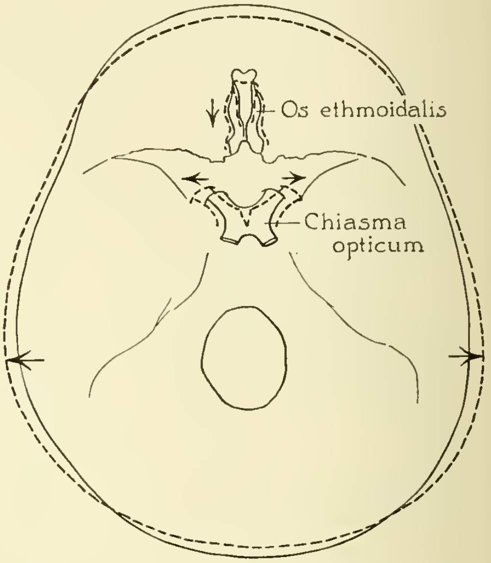


Fig. 4. Schematic drawing illustrating "spread" of optic foramina in compression of the cranium from force applied antero-posteriorly.

The third type of fracture mentioned (petro-occipital, extending to the spheno-petrosal suture) tends to follow a line parallel to the axis of the petrosa. The fracture line often reaches the sella turcica, running from behind forward and from the lateral to the mesial border, that is, perpendicular to the optic nerve on the same side. In this type of fracture, too, since the separation occurs in the direction of the course of the nerve, it may be assumed, that the nerve is suddenly and violently pulled by the spread of the bones, the force being transmitted to the chiasmal fibers as previously described.

Of particular interest in connection with the mechanism of injuries to the cortical portion of the visual apparatus are the cases of pressure atrophy of the brain following cerebral trauma.

Temple Fay in a recent article elucidates the underlying causes of these frequently overlooked or incorrectly diagnosed conditions. He demonstrates the effects of injury to the mechanism concerned in the secretion of the cerebrospinal fluid (the subarachnoid villi and pacchionian bodies) and shows the importance of encephalography in the later determination of the degree of damage to the cerebral cortex.

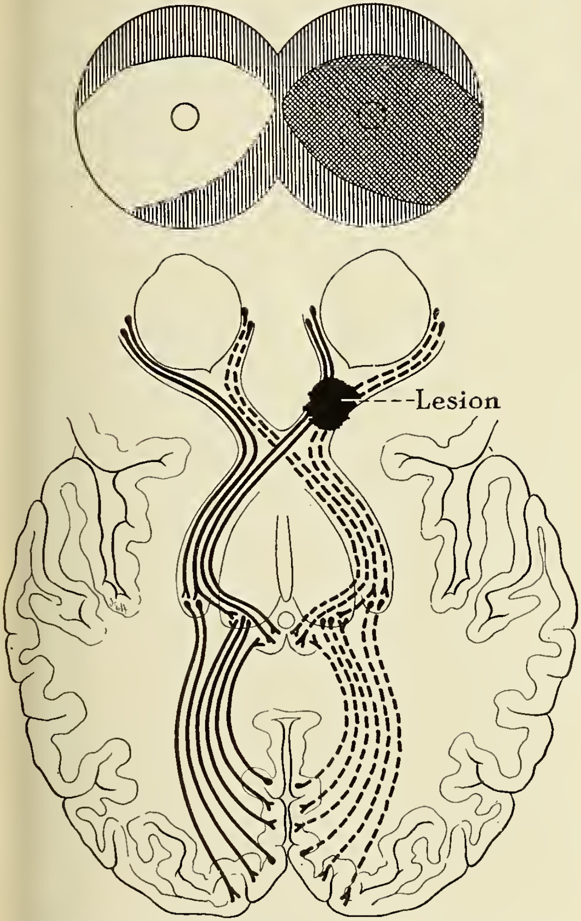


Fig. 5. Visual field in total destruction of optic nerve between retina and chiasm.

The experience of surgeons during the Great War has materially enriched the literature concerning the visual effects of cranial injuries even though, at that time, the examination of patients immediately following the trauma was, as a rule, necessarily superficial. Under the circumstances, detailed study of visual disturbances with careful mapping of fields, etc., could not be undertaken until considerable time had elapsed.

There is still much to be learned in regard to cerebral localization so far as the visual apparatus is concerned. For example, considerable difference of opinion exists in regard to the cortical representation of the macula. In the light of what knowledge we now possess, it is, however, possible to locate, with considerable exactness, a lesion anywhere along the visual pathway from the retina to the higher cortical centers. These lesions are classified by Bing as follows:

1. Lesions of the retina.
2. Lesions of the optic nerve.
3. Lesions of the chiasm.

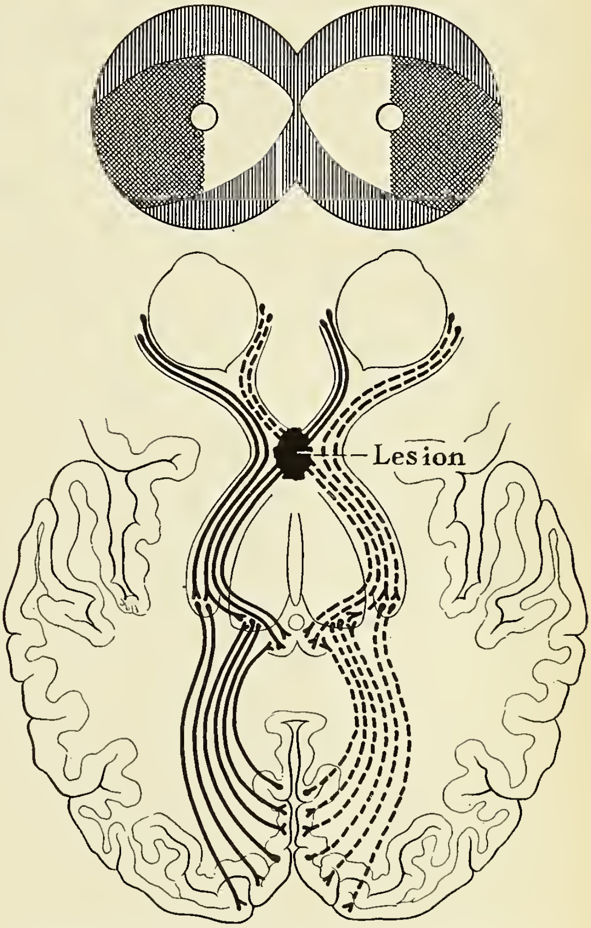


Fig. 6. Visual field in destruction of mesial fibers of optic chiasm.

4. Lesions of the optic tract, primary visual centers and radiation of Gratiolet.
5. Lesions of the area striata (cortex of the cuneus and upper part of the lingual gyrus).
6. Lesions of the convexity and white matter of the occipital lobe and the angular gyrus.

RETINA

Commotio retinæ is usually due to direct contusion of the eyeball, but cases of transient loss of vision may occur after head injuries in which there is no apparent injury to the globe. These may, rarely, show a slight cloudiness of the fundus but usually the ophthalmoscopic examination is negative.

A number of cases of retinal or pre-retinal hemorrhages following head trauma have been reported. Papilloedema, when it occurs, usually appears on the fourth day after the injury. It may, on rare occasions, be found as early as the third day or as late as the eighth day. Forrester, in examining the fundus in a large series of cases shortly after injury, did not observe a single case of choked disc.

OPTIC NERVE BETWEEN GLOBE AND CHIASM

Monocular blindness, exclusive of direct injury to the eye itself, is caused only by a lesion at this site (Fig. 5). In total destruction of the fibers the blindness is, of course, complete. If only part of the nerve fibers are destroyed an irregular restriction of the field of vision, scotomata, etc., will be found. In complete destruction pupillary responses are not evoked by the affected eye but may be by the other eye, whose perception of light is unimpaired. Injuries at this point are promptly followed by atrophy of the nerve. The nearer to the disc the injury occurs the sooner the atrophy ensues.

CHIASM

If the lesion resulting from the injury involves, as it usually does, only the mesial portion of the chiasm, there is a partial or complete destruction of the decussating fibers coming from the nasal halves of the retina. The result is a bitemporal heteronymous hemianopsia (Fig. 6).

If the external portions of the chiasm are destroyed, the mesial fibers remaining intact, there is suppression of the outer halves of the retinæ, giving rise to a nasal heteronymous hemianopia. Although rare, this may occur as a result of disease, but it is practically unknown in traumatic cases. Apparently the late war furnished only one case of a traumatic lesion of this kind and that was not very thoroughly studied.

A lesion destroying exactly one-half of the chiasm would cause a complete loss of sight in the eye on the injured side and a temporal hemianopsia in the other eye.

Optic atrophy (affecting the corresponding sectors of the discs) does not appear until some time after the injury. The atrophy is more marked in the disc contralateral to the injury because of the crossed bundle being larger than the non-decussating one.

OPTIC TRACT, PRIMARY VISUAL CENTERS AND RADIATIONS OF GRATIOLET

Destructive lesions here cause homonymous lateral hemianopia for the halves of the visual field on the side opposite to the lesion (Fig. 7).

It is possible to determine whether or not the injury has involved a point peripheral to that at which the reflex fibers to the Edinger-Westphal nucleus are given off by eliciting the hemianopic pupillary reaction (Wernicke's phenomenon). This is best carried out by using a small pocket flashlight with the end covered except for a small opening emitting a narrow pencil of light rays. This is held at about 45 cm. from the point of fixation through either half of the visual field while a disc of dull black cardboard or blotting paper is held on the side of the nose in order to prevent the reflection of rays toward the normal half of the retina. The test must, of course, be carried out in a darkened room.

If the injury has caused a lesion peripheral to the point at which the reflex fibers to the pupillary nucleus are given off, the light thrown on the blinded half of the retina will not cause a contraction of the pupil, its access to the oculomotor nucleus being blocked. On the contrary, if the lesion is central to this point, the pupil will react to the light since the nerve impulses are carried as far as the centers for the iris sphincters, although not being able to reach the cortical centers of vision.

AREA STRIATA (CORTEX OF THE CUNEUS AND UPPER PART OF THE LINGUAL GYRUS)

If the whole visual area of the cortex on one side is destroyed (Fig. 8), the result is the same as in a destruction of the thalamo-occipital fibers on the same side, *i.e.*, a homonymous lateral hemianopsia with retained pupillary reaction. If only a part of one cortical area is destroyed only a segment of the lateral field is obliterated, causing a quadrant hemianopsia or symmetrically situated scotomata.

CONVEXITY AND WHITE MATTER OF THE OCCIPITAL LOBE AND OF THE ANGULAR GYRUS

"Bilateral lesions involving the visual memory centers in the cortex or the association fibers which pass thither from the area striata cause conceptual blindness, a condition in which the patient can see objects as flat surfaces or as solid bodies but is unable to recognize them for what they are or to state their objects and uses.”

Injuries to the angular gyrus cause alexia (inability to read) and sometimes a conjugate deviation. In case of a destructive lesion of the gyrus the deviation is toward the side of the lesion, the angular gyrus being a thoroughfare for fibers which connect the visual area with the frontal centers for the ocular muscles.

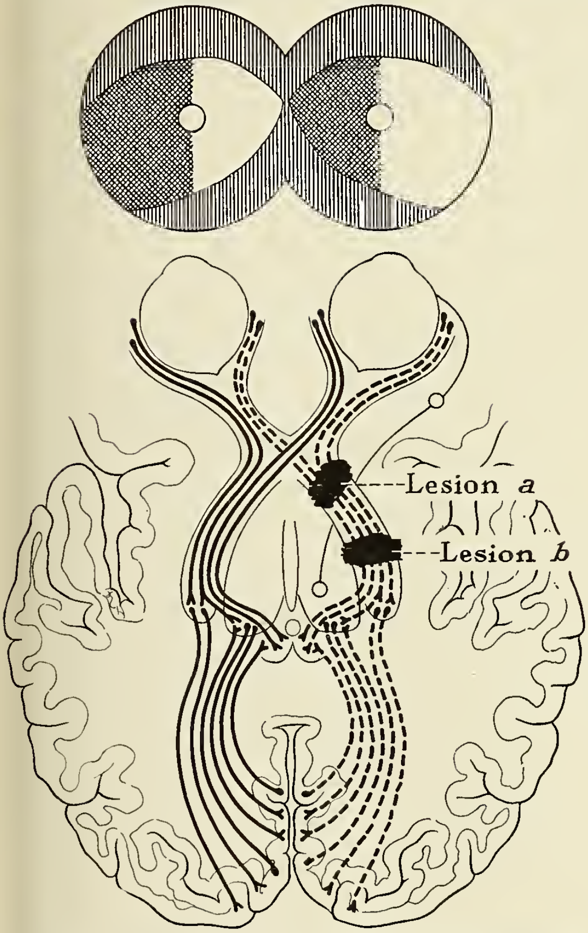


Fig. 7. Visual field in destruction of the right visual tract. (Lesion “A” peripheral to Edinger-Westphal nucleus —causing homonymous hemianopia with abolished hemianopic pupillary reaction.) (Lesion at “B” giving rise to same field changes with retained pupillary reaction.)

LOSS OF ABILITY TO DISTINGUISH COLORS

Head trauma may be followed by loss of the color sense. This may be transient or permanent and may affect all or only a part of the visual field. Color blindness may be the only visual symptom complained of or it may be associated with impairment of central or peripheral vision. In traumatic cases, the fields of vision for color contract earlier that those for form, the nerve fibers concerned in the conduction of colors being apparently more sensitive to the effects of pressure than those concerned in the transmission of the perception of form. Suker says that lesions central to the chiasm and tract are very seldom preceded by color changes and ascribes this to the fact that beyond the primary centers the form and color fibers are more widely separated than they are in the nerve, chiasm and tract.

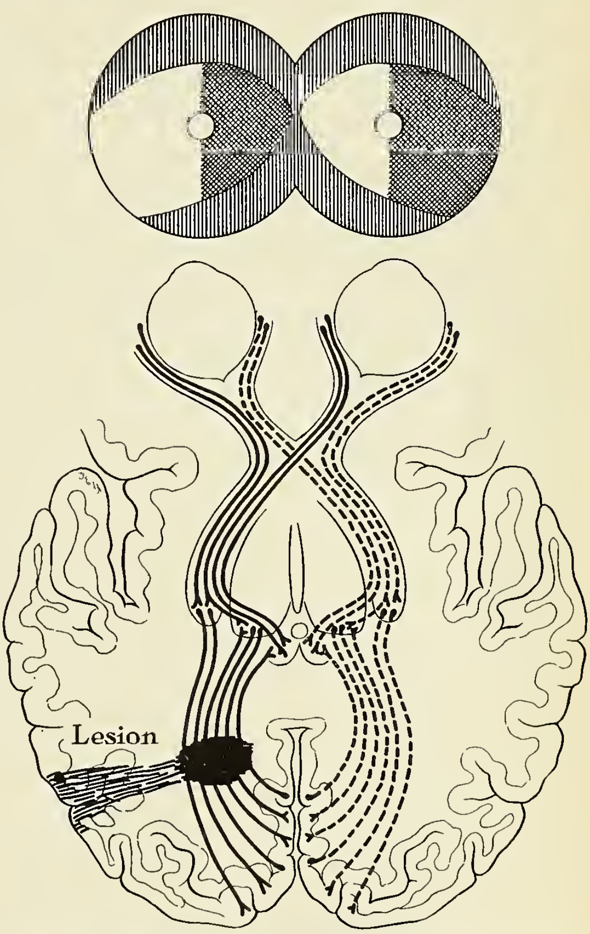


Fig. 8. Fields in destruction of white matter of occipital lobe. (Homonymous hemianopsia with alexia.)

MOTOR DERANGEMENTS

These may affect the lids, the muscles concerned in ocular movement or the intrinsic muscles governing the pupil and accommodation.

Paralysis of the orbicularis palpebrarum occurs rather frequently in injuries of the facial nerve. Parsons says that unilateral facial paralysis is the most common cranial nerve lesion in fractures of the skull base. The injury may affect the supra-nuclear or infra-nuclear portion of the nerve. As a rule the orbicularis is not involved in lesions situated above the nuclear center. These paralyses are important clinically since the defective lid closure causes the cornea to be exposed to desiccation, especially during sleep. This is sometimes followed by a keratitis e lagophthalmo with subsequent impairment of sight.

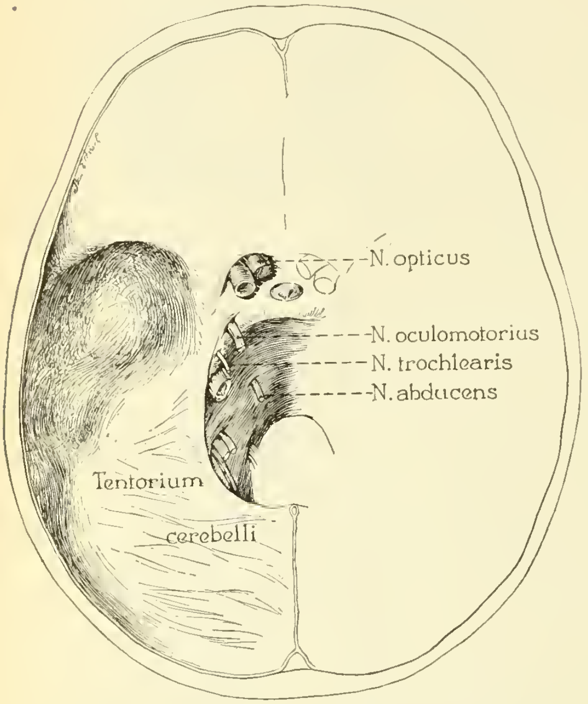


Fig. 9. Dissection of skull base showing relationship of oculomotor, trochlear and abducens nerves.

Paralysis of the levator palpebræ superioris sometimes follows head injury. The trauma may affect the nerve close to the lid, in which case a simple ptosis will follow. In case the injury to the third nerve has affected a point above where the levator fibers are given off, some or all of the other muscles innervated by the oculo-motor will be involved.

Interruption of the sympathetic oculo-pupillary innervation is evidenced by the Bernard-Horner syndrome.

1. "Sympathetic" ptosis from paralysis of the involuntary portion of the levator of the upper lid.

2. Enophthalmos from paralysis of the musculus orbitalis. (This may be slight or not demonstrable at all.)

3. Paralytic miosis from interference with the function of the dilating fibers of the pupil.

This syndrome is a rather rare sequel of head injury. In one case seen by the writer the patient gave a history of having been injured in an automobile accident. He was thrown against the side of the car, striking the left side of his head against the frame. He was dazed for a while but only unconscious for a few moments, if at all; there was no evidence of skull fracture; the skin was unbroken; there was a bruise over the left temple and a discoloration of the left upper eyelid—typical Bernard-Horner syndrome. Neurological findings were otherwise negative. When the patient was last seen, two months after the injury, the condition was unchanged.

The most frequently encountered of the traumatic paralyses of the extrinsic muscles are those of the sixth nerve (abducens). This nerve is particularly vulnerable because of its long course, its exposed position, and its relations to the petrous portion of the temporal bone and the petro-spheno-basilar ligament (Fig. 9).

In destructive injuries there is complete paralysis of the external rectus muscle with inability to abduct the eye. Abducens palsy follows in about 4 per cent of all basal fractures. Because of the supranuclear innervation of the ocular muscles being almost altogether bilateral, unilateral paralyses are nearly always due to nuclear or infranuclear lesions.

Post-traumatic lesions of the third nerve (oculomotor) are less frequent, occurring in about 2 per cent of basal skull fractures. All, or only a part, of the muscles supplied by the nerve may be affected. In ophthalmoplegia totalis there is a ptosis (from paralysis of the levator) and the eye is turned strongly outward and a little downward from the action of the muscles not supplied by the third nerve, *i.e.*, the external rectus and the superior oblique. Strictly speaking, of course, a total ophthalmoplegia would involve the abducens and trochlearis as well. The pupil is dilated and immobile and the power of accommodation is lost. The paralysis may affect only the extrinsic muscles, leaving the mechanism of the pupil and accommodation intact, or it may affect only the sphincter of the pupil and the ciliary muscle. By reason of its extensive connection with the petrosa the third nerve shares, in a measure, the vulnerability of the abducens and trochlearis; it is particularly liable to be injured in fractures running into the superior orbital fissure. The nerve enters the fissure at its largest part close to the optic foramen and hence it is frequently involved in fractures of this region.

The fourth cranial nerve is affected in about 1 per cent of basal fractures. In patients who have sustained an injury to the trochlearis there is a characteristic tendency to turn the head toward the shoulder of the affected side and drop the chin in an effort to overcome the double vision. The image seen by the paralyzed eye is lower than that of the injured, and its upper end is tilted inward.

Reflex immobility of the pupil (Argyll-Robertson's sign) may occur as a result of cranial trauma. It is usually transitory. When due to an njury of the reflex centers it is bilateral. When bserved in connection with injury to the orbit t is usually unilateral.

In injuries of the association centers (Fig. 10), there are encountered the type of paralyses which do not affect the muscles individually but which interfere with associate movements. This may take the form of an inability to converge, o look to the right or left, or upwards or downwards. In injuries causing destruction of the ibers of the cortico-nuclear tract above the pons, he patient looks toward the side on which the esion is located; on the contrary, if the lesion is n or below the pons (the fibers of the tract aving crossed) he looks away from the injured ide.

Compensation usually occurs in conjugate aralyses which are, therefore, as a rule, not ermanent. Riley says that there may be a aralysis of lateral deviation without any demontrable lesion of the sixth nerve nucleus, and tates that the center for lateral deviation is not dentical with the abducens nucleus, but is ituated in the near vicinity. He has observed ilateral loss of conjugate gaze in midline pon-ine lesions.

NYSTAGMUS

Nystagmus is an infrequent sequel of head injuries. Blakeslee observed it in thirteen out of ix hundred and ten cases. It is an early symptom in those cases in which it occurs. The ystagmus following brain-stem lesions is apt to e permanent and thus may affect the future earning power of the injured person. That following injury to the labyrinth or cortical centers is usually transitory. Nystagmus observed in a person who has sustained a head injury is not necessarily a consequence of that injury. It may be congenital or due to some pre-existing condition such as labyrinthine disease, diseases of the central nervous system, such as multiple sclerosis, cerebellar lesions, etc. It is sometimes observed in alcoholics and in drug addicts and may occur as an occupational neurosis, as in coal miners.

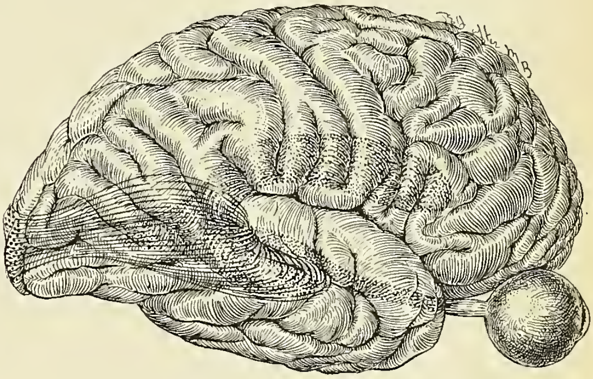


Fig. 10. Projection of visual tracts on brain surface. (After Max Brödel.)

Head trauma is also sometimes followed by simple conjugate oscillatory movements of the eyeballs. In such cases the oscillations are simple and irregularly grouped, lacking the characteristic rythmic phases of true nystagmus.

PSYCHIC AFFECTIONS OF THE SIGHT FOLLOWING HEAD INJURY

These may be grouped under two general headings: those cases due to hysteria, in which the underlying principle is that of inhibition; and those which are the result of a traumatic neurasthenia, in which the essential element is fatigue.

The theoretical differentiation of these conditions is simple, but the establishing of a valid clinical diagnosis may offer considerable difficulty. Hysteria and neurasthenia may co-exist in the same patient; a tendency to malinger may complicate either condition, thus adding to the difficulty in arriving at a conclusion.

The particularly interesting feature of ocular hysteria, as of that affecting other parts of the body, is its simulation of a wide range of organic conditions. Head's classification of the ocular manifestations of hysteria is as follows:

1. Disturbances of sensibility
    - Anesthesia and hyperesthesia of the skin of the lids, cornea and conjunctiva
    - Photophobia
    - Neuralgia
2. Visual disturbances
    - Diplopia
    - Polyopia
    - Erythropsia
    - Macropsia and micropsia
    - Amblyopia and amaurosis
    - Hemeralopia (from reduced retinal function)
    - Visual field disturbances
3. Disturbances of motility
    - Ptosis
    - Blepharospasm
    - Strabismus
    - Spasm of accommodation
    - Miosis and mydriasis
    - Hysterical cycloplegia
    - Accommodative asthenopia
    - Nystagmus
    - Conjugate deviation
    - Convergence insufficiency
    - External ophthalmoplegia
4. Secretory disturbances
    - Epiphora and lacrymation
    - Dryness of conjunctiva
5. Subjective complaints
    - Insomnia
    - Vertigo
    - Inability to concentrate

The characteristic perimetric changes in hysteria are:

1. Concentrically contracted fields
2. Tubular fields
3. Reversal of color fields

It is of interest to note that even in extreme contraction of the fields, these hysterical patients have no difficulty in orientation such as accompanies similar contractions due to organic lesions.

Head injury in a neurasthenic person or one with a neurasthenic tendency may be followed by the exhaustion phenomena characteristic of ocular neurasthenia. These phenomena may take the form of an incapacity of the eye for continuous exertion in close work, pain on continued reading, sensitiveness to light, etc. The characteristic spiral fatigue field of Von Reuss is frequently encountered. In hysteria the involvement of the field is usually constant, while in neurasthenia it is variable.

REFERENCES

1. Ajello, L. Fracture of cranium with involvement of optic fore-arm on opposite side; anatomical note. Ann. di ottal. e clin. occul., 52:653, 1924.
2. Benincasa, G.: Craniocerebral traumata and disturbances of vision. Gior. di ocul., Napoli, 4:101, 1923.
3. Blakeslee, G. A.: Eye manifestations in cranial fractures. Arch. Ophth., 2:566, 1929.
4. Boveri, P.: Pupillary disturbances and injuries to the head. Atti d. Soc. lomb. di sc. med. e biol., Milano, 8:157, 1918.
5. Brown, L. P.: Blindness following violence to the skull. J. Ophth., Otol. and Laryngol., 29:417, 1925.
6. Bruckner, A., and Weingaertner, M.: Rhino-ophthalmologischen Erfahrungen bei Schussverletzungen des Gesichtsschädels. Ztschr. f. Laryngol., Rhinol. (etc.), 10:435, 519, 1921, and 11:8, 1922.
7. Cairns, Hugh; Goulden, Charles, and others: The ocular manifestations of head injuries. Tr. Ophth. Soc. U. Kingdom, 49:314, 1929.
8. Caprioli, N.: Case of immediate loss of vision in left eye as the result of direct trauma of fronto-superciliary region on same side. Med. Prat., 5:92, 1920.
9. Charamis, J. S.: Paralysis of oculomotor nerve in fractures of base of skull. Arch. d'opht., 45:759, 1928.
10. Collin, L.: Retinal hemorrhages following contusion of cranium. Clin. opht., 29:379, 1925.
11. Coppez, H.: Mechanism of injuries of optic chiasm in cranial injuries. Arch. d'opth., 46:705, 1929.
12. Cords, R.: Nystagmus following cranial injury. Klin. Monatsbl. f. Augenh., 83:180, 1929.
13. Della Cioppa, A.: Rare case of ocular tremor simulating vestibular nystagmus observed in connection with injury to head. Rassegna internaz. di clin. e terap., 4:66, 1923.
14. Euzière, J., and Margarot, J.: Cranial traumatism and Argyll's sign. Montpel. med., 42:30, 1920.
15. Finkelnburg: Spätlähmung von Augenmuskeln nach Schädeltrauma. Aerztl. Sachverst.-Ztg., 30:61, 1924.
16. Fleischer, B., and Ensinger, T.: Homonym-hemianopische Gesichtsfeld-störungen nach Schädelspez. Hinterhaptschüssen; über 67 Kriegsverletzungen des Hinterhaupts, bzw. der Sehbahnen. Klin. Monatsbl. f. Augenh., 65:181, 1920.
17. Glauning, E.: Ueber Veränderungen in der Augenhöhle und an den retrobulbären Teilen des Auges bei Kopfschüssen. Klin. Monatscl. f. Augenh., 62:68, 1919.
18. Grignolo, F.: Lesions of visual apparatus in gunshot injuries to head. Gior. d. r. Accad. di med. di Torino, 25:3, 1919.

9. Gunn, M. L.: Eye observations in severe head injuries. Kentucky Med. Jour., 27:119, 1929.

0. Hofmann, L.: Lesion of labyrinth with nystagmic dissociation as the result of cranial traumatism. Ann. D. mal. de l'oreille, du larynx (etc.), 44:1254, 1925.

1. Israel, C.: Simple optic atrophy of one eye and papillary stasis of the other in a case of cranial traumatism complicated with meningitis. Bull. Soc. d'opht. de Par., 376, 1926.

2. Jost, A., and Draganesco, S.: Temporary blindness and right brachial monoplegia following injury to head. Rev. d'oto-neuro-ocul., 4:529, 1926.

3. Kino, F.: Vulnerability of infra-orbital nerve in blunt head injuries. Deutsche Ztschr. f. Nervenh., 110:191, 1929.

4. McCullough, C. J. and W. J. L.: Loss of peripheral vision after head trauma. Am. Jour. Ophth., 12:741, 1929.

5. Miceli, I.: Alterations in optic nerve following injuries to head. Gior. di ocul., 6:25, 1925.

6. Morax, V.: Ocular syndromes resulting from multiple intracranial projectile wounds: homonymous hemianopsia, neuroparalytic keratitis, paralysis of dextrogyres. Ann. d'ocul., 154:300, 1917.

7. Moscardi, P.: Injuries to head and lesions of optic tracts. Ann. di ottal. e clin. ocul., 53:914, 1925.

8. Nueffer, H.: Four cases of fracture of cranium causing visual disturbances. Mitt. a. d. Grenzgeb. d. Med. u. Chir., 41:196, 1929.

9. Rand, C. W.: Significance of dilated pupil on homolateral hemiplegic side in cases of intracranial hemorrhage following head injuries; report of 7 cases. Arch. Surg., 18:1176, 1929.

0. Riley, Henry Alsop: The central nervous system control of the ocular movements. Arch. Ophth., 4:5, 1930.

31. Rose, F.: Ocular sympathetic syndrome in traumatism of head. Rev. neurol., 27:363, 1920.

32. Silva, R.: Interpretation of fundus oculi in cranial traumatism. Gac. med. de Mexico, 55:49, 1920-1921.

33. Somberg, J. S.: Ocular defects arising from skull injuries. Forms. Bull. No. 10 of: New York (State) Dep. Lab. Bur. Workmen's Compensation, Med. Div., 1924.

34. Suker, George F.: Trans. Indiana Academy of Ophthalmology, 1925.

35. Terrien, F.: Diagnostic value of ocular syndrome of hypertension in injuries of head. Paris med., 29:277, 1918.

36. Terrien, F.: Ocular disturbances resulting from craniocerebral traumatism. Progrès méd., 41:411, 1926.

37. Thies: Doppelseitige Papillitis im Anschluss an stumpfe Schädelverletzung. Klin. Monatsbl. f. Augenh., 73:411, 1924.

38. Vail, H. H.: Anatomical study of Dorello's canal. Laryngoscope, 32:569, 1922.

39. Velter, E.: Ocular disturbances in injuries of the head. Arch. d'opht., 36:17-91, 1918.

40. Villard, H.: Ophthalmic symptoms in unrecognized fracture of base of skull. Paris med., 2:191, 1929.

41. Werner, L.: Head injury followed by loss of vision in one eye. Tr. Ophth. Soc. U. Kingdom, London, 39:376, 1919.

42. Wick, W.: Doppelseitige reflektorische Pupillenstörung nach Schädeltrauma. Klin. Monatsbl. f. Augenh. Stuttg., 65:868, 1920.

43. Worms, G.: Subjective disturbances of vision in connection with craniocerebral lesions. Ann d'ocul., 160:456, 1923.

44. Würdemann, H. V.: Injuries of the head and eyes in warfare. Mil. Surgeon, 49:443, 1921.

PRESIDENT'S LETTER

THE present unprecedented program for veteran's relief was already foreshadowed in 1920 when the United States Public Health Service was replaced by a Veteran's Bureau for the administration of disabled veterans' affairs.

Why did not the American Medical Association committees who approved those original medical policies of the Veterans' Bureau, propose, instead, their enlightened 1931 insurance plan for the care of veterans?

This is a question that the men who are working for the Shoulders insurance proposal for modifying the government veterans' program are going to meet often in the next few months particularly from officials of the disabled veterans' associations. These officials have been working all these years, they tell me, for just such liberalizations of the Veterans' Bureau policy with regard to the war disabled as the Shoulders plan would guarantee to every veteran whatever the origin of his disability with one sweeping gesture.

The physician and organized medicine in general undoubtedly missed a brillant opportunity to perform a great public service when they failed to see the obvious trend in those early crowded days of random veterans' relief measures.

That it is much easier to see obvious trends after these trends have unmistakably revealed themselves goes without saying. War was never before fought on the scale of the World War and war relief drawn to the scale of the present Veterans' Bureau program was hardly even to be imagined. It is not to be wondered at, probably, that few physicians or anybody else foresaw the magnitude to which the program would grow in less than fifteen years from the date of the armistice.

To do anything now to divert the feverish hospital building program of the government, to check the debilitating policy of paternalism toward the ex-soldier will be harder, much harder, than ten years ago or five years ago or even two years ago before the appropriation of the last congress was made.

We must recognize this fact at the same time we acknowledge, also, that it does not relieve us from the obligation of doing what we can now.

The resolution offering disability insurance in place of unlimited government hospitalization for ex-service men has the support of many wise men in and out of the medical profession. It was sponsored by H. H. Shoulders of Tennessee at the May House of Delegates meeting of the American Medical Association and it appears to offer a workable solution to the problem of supplying all veterans with medical care for all their ailments without involving the government in a huge system of veterans' hospitals. As explained and commented upon by C. B. Wright in his paper in this issue of MINNESOTA MEDICINE this plan would relieve the government of the enormous expense involved in adequate care for the veterans while the veterans themselves would be at liberty, under the terms of a general disability policy, to get their own treatment where and from whom they chose.

The form that this disability policy might take is by no means confined to the suggestions embodied in the Shoulders resolution. In point of fact, certain inequalities between the treatment of service connected and non-service connected cases implied in the resolution have already been called in question by service men's organizations and will doubtless be adjusted.

The point is that only a fraction of the hospitals have been built that must be built if the Veterans' Bureau is to continue in its present policy, only a fraction of the money spent. If some such scheme as the Shoulders resolution suggests is feasible at all, either now or in the remote future, it should have the active earnest support of every forward looking citizen.

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its

EDITING AND PUBLISHING COMMITTEE

A. S. HAMILTON, M.D.	Minneapolis
D. C. BALFOUR, M.D.	Rochester
J. T. CHRISTISON, M.D.	St. Paul
E. L. GARDNER, M.D.	Minneapolis
JOHN M. ARMSTRONG, M.D	St. Paul
R. E. FARR, M.D.	Minneapolis

CARL B. DRAKE, M.D., St. Paul	Editor
Lewis M. Daniel, M.D., Minneapolis	Assistant Editor

Associate Editors

A. B. Stewart, M.D., Owatonna	First District
F. M. Manson, M.D., Worthington	Second District
Geo. B. Weiser, M.D., New Ulm	Third District
H. B. Aitkens, M.D., LeSueur Center	Fourth District
F. U. Davis, M.D., Faribault	Fifth District
E. L. Gardner, M.D., Minneapolis	Sixth District
Paul Kenyon, M.D., Wadena	Seventh District
O. E. Locken, M.D., Crookston	Eighth District
E. L. Tuohy, M.D., Duluth	Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV September, 1931 No. 9

THE SHOULDERS RESOLUTION

Elsewhere in this magazine is an important aper by Dr. C. B. Wright of Minneapolis in hich is outlined the major arguments in sup-ort of the Shoulders resolution passed in May y the House of Delegates of the American Med-cal Association.

Similar discussions are appearing currently in edical journals all over the country represent-ng the first steps in an important general move-ent among physicians and legionnaires to mod-fy the existing government policy with regard o Veterans' relief.

This new movement pins its hopes upon a system of insurance for veterans by which all who are disabled for any cause may be permitted to avail themselves at their own choice of civilian medical service and civilian hospitalization.

This insurance plan is designed to save the government enormous amounts of money for hospital building and staffing; to protect ex-soldier morale now seriously endangered by the paternalistic policy of the Veterans' Bureau and to find a means for using the already alarming number of empty beds in civilian hospitals.

In point of fact, the current hospital building program of the Veterans' Bureau presents a curious anomoly to anybody who is familiar with the situation in civilian hospitals. For the most part civilian hospitals are not in any sense money making institutions. They are very largely equipped by private gifts and endowments. Their present serious financial straits and the high prices that are necessarily charged to patients are due to the fact that a large proportion of their beds are empty. And yet this huge endowment in equipment is about to be duplicated a hundred times over by the Government and for hospitals that will further empty civilian hospital beds.

It is a question what the poor civilian who can claim no service record and no son or husband or father with a service record is going to do in another decade or two to get his hospital treatment at a fee that he can afford to pay in one life time.

There is one legtimate objection to this new agitation for a change in the administration of veterans' affairs. That is, of course, that it is a little late. Since the last Congress the Veterans' Bureau is already embarked on a greatly magnified new hospital building program. Many thousands of ex-service men with disabilities of non-service connection have already applied for and received all manner of treatment in Veterans' Bureau hospitals. But the difficulty of re-agitating this matter in Congress, of upsetting a new procedure which is rapidly acquiring the force of old precedent, should not deter any really intelligent, determined effort toward changes. When the present appropriations are used up, more appropriations must be made, hundreds more hospitals must be built, untold millions spent, if the Veterans' Bureau is to continue unchecked in its present program.

It is interesting to recall in this connection that a definite concerted medical movement for a change in veterans' policy has been brewing for some time in Minnesota. Resolutions of objection to the government program have passed our House of Delegates several times and the same insurance plan that was later amplified by Dr. Shoulders received considerable attention when it was proposed at the Duluth meeting more than a year since.

MITRAL INSUFFICIENCY

Less than two decades ago the diagnosis of mitral insufficiency was unusually common; today it is rather infrequently made. This turn of affairs has been referred to ironically by some as the result of medical vogue, but this is not the case.

Great strides have been made in recent years toward greater accuracy of cardiac diagnosis, attributable in large measure to critical correlation of clinical and pathologic data, the latter obtained by carefully conducted necropsy. Another important influence which has favorably affected diagnostic accuracy is the changing attitude of members of the medical profession as a whole; the attitude of contented indifference has been supplanted by one of critical inquiry. Even in days recently past, proof of diagnosis was demanded by a relatively small number of members of the medical profession; today, the pendulum, fortunately, is swinging in the opposite direction.

The presence of a systolic murmur, audible over the thorax, in the region of the apex of the heart, previously was considered sufficient evidence for the diagnosis of mitral insufficiency. Few attempts were made to distinguish regurgitation of blood at the mitral orifice, the result of endocardial valvular disease, from regurgitation due to stretching of the ring, such as may occur in hypertrophied and dilated hearts, without endocardial disease. Other causes of apical systolic murmurs, such as sclerosis of valves influences bringing about acceleration of flow o blood, such as occurs in severe anemia and i hyperthyroidism, were not usually distinguishe from true mitral insufficiency.

Richard Cabot's very emphatic statement which appeared in 1926, to the effect that uncomplicated mitral insufficiency is a nonentity went far toward influencing the modern concep regarding this lesion. His conclusions, based o material obtained at necropsy, unquestionabl are correct so far as his particular series is concerned, but it is impossible to deny the possibl existence of a lesion on the basis of one individual's experience only.

The modern teaching, in brief, states that th presence of evidence indicative of mitral endocarditis invariably warrants the diagnosis of mitral stenosis.

The average normal mitral orifice in adult lif has a circumference of 10 cm. From time t time cases are observed, in which, in life, objective signs justifying the diagnosis of mitral stenosis are not revealed and in which, at necropsy narrowing of the mitral orifice or stenotic fusio of the valve leaflets are not seen, but clear-cu deformity of leaflets exists, permitting varyin degrees of mitral insufficiency to occur.

Furthermore, as shown by Bass and other the rheumatic endocarditis of children is frequently unattended by demonstrable mitral stenosis. Bass, in fact, believes that at least a thir of the cases of mitral insufficiency in childhoo are not complicated by stenosis. It is probabl that most cases of mitral endocarditis are firs brought into evidence by the manifestations o mitral insufficiency, the stenotic process occurring coincidently, or later, as the case may b

It seems desirable, after analyzing the actua facts at hand, to pursue a middle path regardin the diagnosis of pure mitral insufficiency. Its occurrence in adults is admittedly rare, but that i occurs occasionally cannot be contradicted, an its rather frequent occurrence in childhood is fact.

Frederick A. Willius.

BIBLIOGRAPHY

1. Bass, M. H.: Acquired diseases of the heart. In Abt's Pediatrics, Philadelphia, W. B. Saunders Co 4:344-401, 1924.
2. Cabot, R. C.: Facts of the Heart. Philadelphi W. B. Saunders Co., 1926, 781 pp.

MISCELLANEOUS

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

MINNEAPOLIS MIDWIFE PLEADS GUILTY TO VIOLATING BASIC SCIENCE LAW

State of Minnesota *vs.* Marska, alias Mars

On July 8, 1931, Emma Marska, alias Emma Mârs,
tered a plea of guilty to violating the Basic Science
aw. The complaint was filed by Mr. Brist, repre-
nting the State Board of Medical Examiners. Mrs.
arska had her place of business at 246 West Broad-
ay, Minneapolis. She specialized in ailments of
omen, her knowledge having been obtained in Russia
here she was a midwife and where she claimed her
sband was a physician.

Judge Leary of the District Court sentenced the de-
ndant to six months in the Minneapolis workhouse.
he sentence was suspended on the one condition that
e defendant absolutely refrain from practicing heal-
g in this state in the future. The Medical Board has
d this case re-checked since the above date and no
idence of law violation has been discovered.

The Medical Board reports the usual good coöpera-
n from the Hennepin County Attorney's office as
ell as very fair consideration from Judge Leary of
e District bench.

NEW AND NON-OFFICIAL REMEDIES

The Council on Pharmacy and Chemistry has ac-
pted the following:

BOTT LABORATORIES

Capsules Pentobarbital Sodium-Abbott, 1½ grains

I LILLY & CO.

Pulvules Pentobarbital Sodium-Lilly, 1½ grains

Elixir No. 229 Ephedrine Sulphate, 2 grains

RKE, DAVIS & CO.

Ventriculin, 100 Gm. Bottle

NDOZ CHEMICAL WORKS, INC.

Sandoptal

Tablets Sandoptal, 0.2 Gm.

NPROPRIETARY ARTICLES

Pentobarbital Sodium

TRUTH ABOUT MEDICINES

Alpha Naphthol Campor Oil (Carel).—It contains
ha-naphthol (New and Nonofficial Remedies, 1931, p.
2), 0.5 Gm.; camphor, 0.5 Gm.; cottonseed oil, 12
n.; liquid petrolatum to make 100 Gm. Carel Labora-
ries, Redondo, Calif.

Alpha-Naphco Camphco Camphor Nasal Unguent.—It
ntains alpha-naphco (New and Nonofficial Remedies,
31, p. 293), 2 Gm.; camphor, 2 Gm.; petrolatum to
ke 100 Gm. Carel Laboratories, Redondo, Calif.

Alpha-Naphco Cones.—Each cone weighs 2.65 Gm. and
ntains alpha-naphco (New and Nonofficial Remedies,
31, p. 293) Gm., in a base composed of boric acid
d sodium bicarbonate, equal parts. Carel Labora-
ries, Redondo, Calif.

Alpha-Naphco Menthol Suppositories.—Each suppository weighs 5.2 Gm. and contains alpha-naphco (New and Nonofficial Remedies, 1931, p. 293), 0.356 Gm., and menthol, 0.014 Gm., in a base composed of oil of theobroma and yellow wax. Carel Laboratories, Redondo, Calif.

Alpha-Naphco Rectal Suppositories.—Each suppository weighs 2 Gm. and contains alpha-naphco (New and Nonofficial Remedies, 1931, p. 293), 0.1376 Gm. in a base composed of oil of theobroma and yellow wax. Carel Laboratories, Redondo, Calif.

Alpha-Naphco Zinc Stearate Camphor Ointment.—It contains alpha-naphco (New and Nonofficial Remedies, 1931, p. 293), 7.5 Gm.; camphor 1.5 Gm.; zinc stearate, 10 Gm.; starch 10 Gm., petrolatum to make 100 Gm. Carel Laboratories, Redondo, Calif.

Alpha-Naphco Zinc Stearate Powder.—It contains alpha-naphco (New and Nonofficial Remedies, 1931, p. 293), 3.65 Gm.; zinc stearate, 8.75 Gm., talcum to make 100 Gm. Carel Laboratories, Redondo, Calif. (Jour. A. M. A., July 11, 1931, p. 103.)

Liver Extract-Lederle.—A concentrated, water soluble, nitrogenous, nonprotein fraction obtained from fresh mammalian liver. It is supplied in vials containing an amount of powdered extract representing approximately 100 Gm. of fresh, whole liver. The product is proposed for use in the treatment of pernicious anemia and tropical sprue. Lederle Laboratories, Inc., Pearl River, N. Y.

Rabies Vaccine (Hixson).—An antirabic vaccine (New and Non-official Remedies, 1931, p. 358) prepared according to the general method of David Semple (phenol killed). The product is marketed in packages of seven vials, in packages of fourteen vials and in packages of fourteen syringes. (Jour. A. M. A., July 18, 1931, p. 179.)

FOODS

The following products have been accepted by the Committee of Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Vitamin D Bond Bread (General Baking Co., New York City).—A white bread prepared by the straight dough process containing an added special nutrient vitamin D equivalent to that of three teaspoonfuls of standard cod liver oil for each 24 ounces of baked bread (140 vitamin D units as defined by the Council on Pharmacy and Chemistry). This bread is an adequate food source of vitamin D for normal nutrition.

Lactogen (Nestle's Milk Products, Inc., New York).—A spray-dried modified cow's milk containing added milk-fat and lactose. The prescribed dilution approximates human milk in percentages of milk-fat, protein, lactose and total minerals and in dispersion of the fat in fine globules. Lactogen is intended for infant feeding.

Uffelmann's Golden Krust Bread (The Uffelmann Baking Co., Cincinnati).—A white bread made by the sponge dough method. It is claimed to be a bread of good quality. (Jour. A. M. A., July 4, 1931, p. 31)

« A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

Social Workers Take Their Hurdles Easily

Economists, both medical and otherwise, may shy and balk. But the delegates to the National Conference of Social Work held at Minneapolis last June, leaped such barriers as State Medicine, for instance, with the greatest ease and jauntiness. And for platform purposes at least they landed safely on the other side.

"All agreed" says a report on the health section meetings of the Conference by Robert W. Kelso of St. Louis, Chairman, "THAT THERE IS NOTHING SACRED ABOUT THE ANCIENT PRACTISE OF PRIVATE SERVICE FOR PRIVATE FEES; that centralized medical service could be rendered on reduced costs to the individual and with more educational effect."

There were other medical matters on which all at this conference were quite as easily agreed. They should be of sufficient interest to the members of the medical profession who are in fact still engaged in the ancient system of private practise for private fees to warrant quoting below.

It should be noted that Mr. Kelso himself is Director of the St. Louis Community Chest. He and most of the other delegates to the Conference deal constantly in one way or another with the problems of looking after the sick and are in fact more than normally concerned in all problems related to the cost of medical care and its extension. The Committee holds no brief for the following, but quotes it as indicative of the social service workers standpoint.

The final session of the division on Health considered the clinic and dispensary movement; first its history and trends; and second an impartial review of the riddle of state medicine. There are those who profess to fear the dispensary movement; not so with the group gathered in Division III. Reviewing recent calculations upon the mounting costs of medical care, the dispensary was hailed as the probable way out of a growing dilemma. Admittedly some go to the dispensary who could afford to pay a private physician, but it was felt that the physician himself is on the defensive to prove that his method of service with private fees is any better or more ethical for the individual than the group of clinics embodied in the dispensary.

On the score of state medicine the usual criticism was raised that the physician was being left out but it was maintained that if the welfare of the public demanded that the physician should group his specialized services in dispensaries, then this should be done: that there is nothing sacred about the ancient process of private service for private fees. All agreed that centralized medical service could be rendered on reduced costs to the individual and with more of an educational effect.

This spirited discussion dealt impatiently with old methods merely because they were old, and insisted that the conditions of modern life demand the best methods regardless of precedent. It may be said that this attitude was the temper of all the sessions of the Division. In no session of Division III was the floor discussion less than one hour in length."

OF GENERAL INTEREST

Dr. Joseph F. Schaefer, formerly of the Mayo Clinic, Rochester, Minnesota, is now located at Owatonna, Minnesota.

Dr. Lewis M. Daniel of Minneapolis left in July for a trip through France, Germany, and Switzerland. Dr. Daniel will return to Minneapolis about September 15.

Dr. Arthur Edward Smith of Minneapolis sailed August 5 for Vienna where he will spend a month in study. Dr. Smith expects to return to his practice about September 22.

Dr. Carl O. Rice and family, of Minneapolis, left August 10 for Europe. Dr. Rice will study for several months as a fellow at the Surgical Clinic, University of Berne, Berne, Switzerland.

TRAINING SCHOOL FOR MEDICAL RESERVE OFFICERS

The third annual Inactive Training School for Medical Reserve Officers will be held at Rochester, Minnesota, October 18 to November 1 under the auspices of the Mayo Foundation. The course is under the direction of Col. Geo. A. Skinner, Surgeon Seventh Corps Area, and is designed to maintain efficiency of Reserve Officers in their present grades or to prepare them for promotion to the next higher grade.

Medical officers contemplating taking the course should apply at once through their respective corp area headquarters.

L. B. Wilson, *Col. Aux. Res.*

FRAUDULENT COLLECTION AGENCY

Another fraudulent collection agency is reported to be operating in Aitkin, Minnesota, under the name, "The United States Commercial Adjustment Company of Chicago."

This company, so-called, got hold of the list of debtors of an Aitkin physician and sent the entire list threatening letters without any warrant or authority from the physician himself.

The probability is that this agency will attempt to work the same trick throughout the territory and all physicians should be duly warned and on the lookout.

Complaints of unreliable and unethical collection agencies come to the attention of the Secretary of the Minnesota State Medical Association very frequently. It should be a rule for all physicians never to select a collection agency or give any information concerning their accounts without expert advice. In every city and every town there is a banker who can give expert advice. Everybody, including doctors, should think of bankers and go to them about financial matters just as the latter go to the doctor when they are sick.

WARNING

W. A. Oyler, lately of Iowa and Illinois and Indiana, and professedly a Doctor of Medicine, has left Des Moines by order of the police and may be headed toward Minnesota or Kansas or some other nearby state, according to letters received in this office from Robert L. Parker, M.D., Secretary of the Iowa State Medical Society and Harold M. Camp, M.D., Secretary of the Illinois State Medical Society.

This new medical beggar left Indiana some time ago with the funds of a number of sympathetic physicians wrung from them by some tale of hard luck. His next stop was Cicero, Illinois, where his stories roused the suspicions of Dr. Camp, and resulted in an investigation by Dr. Arthur J. Cramp, Director of the Bureau of Investigation of the American Medical Association. The fraudulent record thus unearthed was sent on ahead of the traveller to Iowa and resulted in his arrest in Des Moines.

He is now at large, however, and all physicians are warned to call the County or State Medical Association headquarters, and above all, to refuse aid if any such man should apply to them.

ASTHMOL AND ASTHMOL-EPHERDRINE NOT ACCEPTABLE FOR N. N. R.

Asthmol and Asthmol-Epherdrine are products of Opotherapeutic Laboratory, Sagone & Co., Palermo, Italy, distributed in the United States by the Asthmol Co., New York. Asthmol is a liquid preparation, marketed in the form of ampoules. The product is stated to be a combination of pituitary and suprarenal extracts but no definite statement of composition or potency is made. As the name suggests, Asthmol is proposed for the treatment of asthma. Asthmol-Ephedrine (also referred to as "Syrup of Asthmol") is stated to be composed of: "Ephedrin 0.20 Sodium Benzoate, iodide and bromide, ana 0.25,—Grindelia, 1.75—In 100 c.c. of gomenolo-balsamic syrup. Contains alcohol: 2 per cent by volume." The claims advanced for Asthmol-Ephedrine are typical of those made for complex mixtures—the praise of each constituent is sung without any consideration being given to the question as to whether the several constituents, even if they have the virtues ascribed to them, are indicated at one and the same time and in precisely the amount furnished by the formula. The Council on Pharmacy and Chemistry finds Asthmol and Asthmol-Ephedrine (Dr. Sagone's Syrup of Asthmol) unacceptable for New and Non-official Remedies because their composition is unscientific and indefinite, because their names are therapeutically suggestive and not descriptive of composition, and because the therapeutic claims made for them are unwarranted. (Jour. A. M. A., July 11, 1931, p. 103.)

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—I have under treatment at the present time an eleven year old girl, who was perfectly well up to July 1st of this year. At that time, she developed generalized hemorrhages in the skin over the entire body. The lesions were first noted on the thighs, but in two days had spread. She also had a slight nose bleed which became more severe and hemorrhages into the tongue which interfered with eating. The fifth day of the bleeding she noticed gross blood in the stool and marked hematuria. Aside from these hemorrhages she has felt fairly well except for headaches.

Physical examination shows a well nourished and developed child. Pulse 102, temperature 99.6, blood pressure 120/76. The hemorrhages in the skin varied from pin point spots to large blotches. The change is most marked on the extremities. Multiple petechia are seen throughout the oral cavity, and blood blisters are present on the tongue and left great toe. The nose shows evidence of recent bleeding. The lymph nodes are not enlarged, neither is the spleen. The tonsils are out. The heart and lungs, and the rest of the physical examination yield no positive findings.

Hemoglobin 75 per cent, erythrocytes 4,440,000, leukocytes 7,250. Differential count—polymorphonuclear neutrophiles 41 per cent, small lymphocytes 55 per cent, large lymphocytes 4 per cent. Platelets greatly diminished. No abnormal red or white blood cells. Coagulation time 7 minutes. Two days later the blood examination was practically the same except that the bleeding time was 5 minutes. The ninth day of the illness, the bleeding time was 3 minutes and the coagulation time 4 minutes. No platelets are seen on the smear.

For the past two days she has been improving. The hemorrhagic spots are fading, but the urine still shows gross blood. Treatment to date has consisted of calcium gluconate by mouth, oral fibrogen, styptysate, and sodium cacodylate. Transfusion has been considered.

I would greatly appreciate suggestions as to the probable diagnosis, treatment, and prognosis.

Answer.—From your description, two conditions will have to be considered: Toxic purpura and thrombocytopenic purpura. The bleeding and coagulation time seem to fall within normal limits. If thrombocytopenic purpura is present, the bleeding time is usually prolonged. The most likely diagnosis is toxic purpura, although the other form cannot be ruled out. Several cases similar to yours have come to our attention. Some of them apparently started as an upper respiratory infection. They have been treated by giving liver extract. A child of eleven should receive about six vials a day. All of our cases have apparently responded to this type of treatment, although one cannot be sure that a natural remission, independent of therapy, did not take place. If the condition is due to a disturbance of the platelets, transfusion may be necessary, if bleeding continues. This type tends to recur and become chronic. The child should be watched from this view point, and if a definite diagnosis of thrombocytopenic purpura can be established, splenectomy is indicated at a later date. Recent reports indicate that about 80 per cent of the cases of true platelet purpura are benefited by this treatment. It is not recommended in the acute types. In addition to the liver extract, your patient should also have a high chlorophyl diet and calcium continued. The outlook is apparently good in your case, but many of these patients do not survive the acute form of purpura, especially the toxic variety.

2. *Question.*—Reports have come to me that there is some serum being used in the chronic stage of Parkinson's disease, and that the results are even better than with hyoscine. If there is any new preparation, I should appreciate hearing about it.

Answer.—The usual treatment of this condition is the use of hyoscine or stramonium. It appears at times as if hyoscine resistent cases respond to stramonium and vice versa. Stramonium may be given in the form of the tincture or the leaves. If the tincture is used, start with 15 minims three times a day after meals; increase the dosage two or three minims at a time until tolerance is reached. This usually occurs at sixty to seventy-fine minims. A typical reaction is usually dry mouth, dilated pupils, and a general feeling of uneasiness. We assume from your letter that you are familiar with the hyoscine treatment.

Serum has not been extensively used although reports in the literature indicate that Coley's serum has been tried. As most people believe that the chief effect of this preparation is due to foreign protein, typhoid vaccine or boiled milk injections may be used. The results of any form of treatment are variable and it is difficult to state what may be expected in a given case. The technique of milk injections was published in the last issue of Minnesota Medicine, XIV, 748, (Aug.) 1931.

3. *Question.*—Is there any contraindication to complete surgical removal of the nipple in a woman past middle life whom I believe has Paget's disease of the nipple? The breast and axilla are entirely negative. Duration is one year. Lesion does not extend beyond the nipple. The biopsy would be sent in at once for microscopic diagnosis. If Paget's disease is present, would deep therapy be the treatment of choice, or should a radical breast amputation be done as soon as the diagnosis is confirmed?

Answer.—Although some authors insist that a preliminary treatment of soap and water should be tried on border line eczematous lesions of the areola, the best method of handling them is to excise the nipple and areola, extending the line of incision well beyond the involved part. If Paget's disease is present, a radical breast amputation, followed by deep X-ray therapy, is the treatment of choice. There are two theories as to the cause of this condition: One, that it is a change in the surface due to disturbance of lymph drainage by carcinoma beneath, and the other that it is a primary malignant degeneration of the nipple and areola. The involvement of the breast and axilla may not be obvious for some time after a simple excision is done. In our experience, many of these cases show a definite tumor later in their course. This is the reason for the recommendation of the usual treatment of malignant disease of the breast for these cases.

OBITUARY

DR. JOSEPH J. McKINNON
1863-1931

Dr. J. J. McKinnon, for thirty-seven years active in the business and social life of Wadena, Minn., died at his home, of arterio-sclerosis, Friday, July 31, 1931.

Of Scotch descent Dr. McKinnon, son of Mr. and Mrs. Laughlin McKinnon, was born in Alexandria, Ontario, Canada, July 22, 1863. He received his early education at the Christian Brothers school and Holy Cross college at Montreal. Possessed of great talent and energy he completed his classical course with honors and took a degree of Bachelor of Arts at Laval University in Quebec in 1884. He spent the next two years as a professor in one of the Catholic institutions in Montreal.

In 1886 he came west and settled for a time at Hudson, Wisconsin, where he engaged in the study of law. Two years later, becoming interested in medicine, he matriculated in the College of Medicine at the University of Minnesota. During his medical course he also taught in the Cathedral school at St. Paul under Bishop Ireland and later became assistant supervisor of Public Night Schools in St. Paul. In this way he paid for his medical education. He was graduated from the university in 1893, and came to Wadena in December of that year.

He returned to Minneapolis for his bride, Miss Anna Blodgett, whom he married September 19, 1894. Dr. and Mrs. McKinnon returned to Wadena where they have since lived. Five children were born to Dr. and Mrs. McKinnon: Mona K., Jerome E., Donald F. and Patricia J. of Wadena and Dr. Laughlin W. of Frazee.

Dr. McKinnon possessed an optimistic and fearless outlook on life and was a man with the courage of his convictions. He was never so happy as when he was using his rugged intellect in a cause which he thought was right. His honesty and courage were widely known and respected and, combined with other admirable characteristics, made his an attractive personalty.

Shortly after his arrival in Wadena he became actively interested in public affairs and served as mayor of the village. He was one of the prime movers in securing the Fair Oaks Lodge sanatorium for Wadena and served as president of the board from the time of its organization until his retirement from public life in 1929. He also administered the affairs of that institution as superintendent from 1925 until 1929.

Likewise he was a strong supporter of the Wesley hospital and served as president of the hospital board after that institution was secured for Wadena. In addition to these offices and the responsibility of a large private practice, he served long terms as county coroner and as city health officer.

Dr. McKinnon considered his profession as a consecrated calling and enjoyed high rank among his professional friends. At various times he held offices in the Minnesota Medical Association and the Upper Mississippi Valley Medical Association. In his years of service as a general practitioner he gave unstintingly of his knowledge, skill, understanding and sympathy.

Dr. McKinnon is survived by his widow, his five children; two sisters, Rev. Sister St. Eusebia, St. Laurent, Ontario, Canada, and Mrs. J. M. MacDonald, Cornwall, Ontario, Canada; and two brothers, Charles of River Falls, Wisconsin and George of Alexandria, Ontario, Canada.

VAPEX

Vapex is manufactured by Thomas Kerfoot and Company, Ltd., England, and is distributed in the United States by E. Fougera and Co., Inc., New York. The stuff is sold at a price that seems to be enormously in excess of the cost of its ingredients, which may explain the vast sums that have been spent on persuading the public that the product is a marvel of therapeutic efficiency. Some of the advertising slogans have been: "Vapex Amazed Scientists . . . Its vapor kills cold germs." "Instant relief for nasal affections with its delightful vapor." An advertisement in *Good Housekeeping* contains the preposterous statement to the effect that "relief from head colds is instantaneous with Vapex." Vapex was examined in the A. M. A. Chemical Laboratory and as a result of this examination the Laboratory concluded that a solution having essentially similar chemical and physical attributes as Vapex may be made as follows: Menthol 15 Gm., Oil of Lavender Flowers 15 c.c., Alcohol 94 per cent to make 100 c.c. It thus appears that this alleged "important medical discovery" is essentially menthol dissolved in alcohol and perfumed with oil of lavender! And it is sold with the implied claim that it will cure nasal infections, give quick relief from catarrh and hay fever, and prevent influenza! (Jour. A. M. A., July 18, 1931, p. 196.)

FAYRO

The Federal Trade Commission has issued a Cease and Desist order against the Fayro Laboratories, Inc., which demands that the unwarranted and false claims made in the exploitation of the "obesity cure" Fayro be discontinued. The Commission found that Fayro had essentially the following composition: Epsom salt, 7½ parts, Common salt, 1½ parts, Glauber's salts 1 part, scented with oil of pine needles. The retail price of Fayro was one dollar; the approximate cost of the ingredients was less than three cents. The exploiters of Fayro advertised that when dissolved in a tub containing a quantity of hot water and the body immersed therein, it would dissolve and remove excess fat. Over one and one-half million packages of Fayro have been sold to the gullible and about one-half million dollars spent in advertising this humbug. When the Federal Trade Commission was holding its hearings, the Fayro concern was able to produce two supposedly reputable physicians, Dr. R. C. Falconer and Dr. William C. Olson, to testify in favor of the nostrum. (Jour. A. M. A., July 11, 1931, p. 122.)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association
Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of September will be as follows:

September 2—Lockjaw Prevention.
September 9—Peptic Ulcer.
September 16—Nutrition Education in Our Schools.
September 23—Bichloride of Mercury Poisoning.
September 30—Hodgkin's Disease.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The following is a tentative program of the meeting of the Northern Minnesota Medical Association which is to be held at Hibbing, Minnesota, on September 14, 1931:

8:30 Clinico-Pathological Conference
Specimens furnished through the courtesy of St. Lukes and St. Mary's Hospitals, Duluth, Minn.
Case presentations by Dr. M. M. Fischer, Duluth.
Pathological reports and specimen demonstration by Dr. George L. Berdez, Duluth.
X-Ray film discussions by Dr. Thos. Gage Clement and Dr. J. R. McNutt, of Duluth.
Discussions led by Dr. E. L. Tuohy, Duluth.
9:30 Ectopic Pregnancy—Drs. R. L. Bowen and T. A. Estrem, Hibbing.
9:50 Multiple Sclerosis—Dr. L. R. Gowan, Duluth.
10:10—Fractures of Tibia and Fibula, Involving the Joints—Dr. C. W. More, Eveleth.
10:30 Pediatric Subject—Dr. O. W. Rowe, Duluth.

INTERMISSION 15 MINUTES

11:05 Common Pathology of the New Born—Dr. Thomas Myers, St. Paul.
11:25 Pathology of Peptic Ulcer—Dr. D. C. Collins, Rochester.

LUNCH

Trip on observation car into Hull-Rust Mine. (Leave Androy Hotel in autobomiles for the mine at 12:45)
2:30 Modern Anesthesia—Dr. J. S. Lundy, Rochester.
2:50 Title unannounced—Drs. R. B. Bray and W. H. Long, Fargo, North Dakota.
3:10 Remote Effects of Head Injuries—Dr. W. H. Hengstler, St. Paul
3:30 Comparison of Number of Physicians in Different Sections of the United States, and also Europe—Dr. N. O. Pearce, Minneapolis.
4:00 What the American Doctor Sees in Europe—Dr. A. M. Snell, Rochester.
BANQUET at 6:30 or 7:00 P. M.—Drs. M. S. Henderson, E. A. Meyerding, and Mr. Mackey.

MISSISSIPPI VALLEY CONFERENCE ON TUBERCULOSIS AND SANATORIUM ASSOCIATION

The joint yearly meeting of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association will be held this year at the Lowry Hotel in St. Paul, September 21, 22 and 23.

This double conference gathers together medical experts in tuberculosis, public health and social workers interested in the anti-tuberculosis movement from 12 Mississippi valley states. Three days of intensive study on medical and medico-sociological subjects and on Christmas Seal organization characterizes the program.

Among the states participating are Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Ohio and Wisconsin.

This year's program, in the hands of J. W. Becker, St. Louis, program chairman and of Walter J. Marcley, M.D., director of the tuberculosis division, U. S. Veteran's Hospital, Fort Snelling, president of the conference, and E. A. Meyerding, M.D., executive secretary of the Minnesota State Medical Association and secretary of the conference, promises to be outstanding among the 18 previous gatherings of the organization's history.

Tuberculin testing in all its aspects; case finding, vital statistics; the problem of tuberculosis in adolescence and the problem of the under-par child all will have consideration at various sessions.

Following is the tentative program of the sanatorium association session:

TENTATIVE PROGRAM
SANATORIUM SECTION MEETING
MISSISSIPPI VALLEY CONFERENCE ON TUBERCULOSIS

Hotel Lowry, St. Paul
September 21 and 22, 1931

Monday, September 21, 9:30 A. M.
Dr. E. R. Van Der Slice, Presiding

9:30 A. M.—Tuberculin Testing by Districts in Minnesota—Dr. W. S. Broker, Otter Tail County Sanatorium, Battle Lake, Minn.
Discussion (10 min.)—Dr. Mary C. Ghostley, Lake Julia Sanatorium, Puposky, Minn.
10:00 A. M.—Phrenico-Exeresis in the Treatment of Lung Disease—Dr. Jerome R. Head, Chicago, Ill.
Discussion.
10:30 A. M.—Increasing Importance of Silicosis—Dr. A. W. Gray, Milwaukee, Wis.
Dicussion.
11:00 A. M.—X-ray Clinic (To demonstrate the value of serial X-ray films in determining the progress of tuberculosis)—

(A) Dr. G. D. Kettelkamp, Robert Koch Hospital, Koch, Mo.
(B) Dr. C. F. Taylor, Kansas State Sanatorium, Norton, Kan.
(C) Dr. Paul D. Crimm, Boehne Hospital, Evansville, Ind.
(D) Dr. W. M. Spears, Oakdale, Ia.

Monday, September 21—2 P. M.
Dr. F. L. Jennings, Presiding

2:00 P. M.—Spontaneous Pneumothorax—Dr. Max Biesenthal, Chicago, Ill.
Discussion.

2:30 P. M.—Endoscopy in the Diagnosis and Treatment of Non-Tuberculous Diseases of the Lungs (Lantern)—Dr. Wm. A. Hudson, Detroit, Mich.
Discussion.

3.00 P. M.—Conservative vs. Surgical Treatment of Bone Tuberculosis—
Conservative Treatment—Dr. Robinson Bosworth, Municipal Tuberculosis Sanatorium, Rockford, Ill.
Surgical Treatment—Dr. Melvin Henderson, Mayo Clinic, Rochester, Minn.
Discussion.

:00 P. M.—(A) What the X-ray Shows in Tuberculin Reactors—Dr. L. G. Rigler, University Hospital, Minneapolis, Minn.
(B) Types of Lesions Noted—Dr. J. A. Myers, Minneapolis, Minn.
Discussion.

onday, September 21—8 P. M., Glen Lake Sanatorium, Oak Terrace, Minn.
Dr. E. S. Mariette, Presiding

:00 P. M.—Tuberculosis Treatment Plus the Three R's—Dr. David A. Stewart, Associate Professor of Medicine, University of Manitoba, and Superintendent of the Manitoba Sanatorium, Ninette, Manitoba, Canada.

:20 P. M.—The Advantages of Surgical Facilities in a Sanatorium—Dr. Jerome Head, Chicago, Ill.

:40 P. M.—Scope and Possibilities of a Laboratory in a Tuberculosis Sanatorium—Speaker to be determined.

:00 P. M.—Changes in the Last Ten Years Made in the Sanatorium Treatment of Tuberculosis—Dr. Walter J. Marcley, President, Mississippi Valley Conference, and Chief of the Tuberculosis Division of the Veterans' Hospital, Fort Snelling, Minn.

Tuesday, September 22—9:00 A. M.
Dr. Alfred Henry, Presiding

:00 A. M.—The Need for Medical Social Service Work in Sanatoria—Miss Marguerite A. Ridler, Director of Social Service, Glen Lake Sanatorium, Oak Terrace, Minn.
Discussion—Dr. Hoyt E. Dearholt, Executive Secretary, Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.

9:30 A. M.—Interesting Case Reports (Each case to include a history, complete clinical information, X-ray records and films, autopsy record, macroscopic and microscopic demonstration.)—
(A) Dr. Wm. S. Middleton, Associate Professor of Medicine, University of Wisconsin, Madison, Wis.
(B) Dr. V. V. Norton, Hamilton County Tuberculosis Sanatorium, Cincinnati, Ohio.
(C) Dr. F. L. Jennings, Glen Lake Sanatorium, Oak Terrace, Minn.
(D) Dr. R. H. Morgan, Detroit, Mich.

11:30 A. M.—Tuberculosis in a Rural District—Dr. Edw. J. Simons, Swanville, Minn.
Discussion (5 min.)—Dr. Herman Hilleboe, Swanville, Minn.
(5 min.)—Dr. J. A. Myers, Minneapolis, Minn.

Tuesday, September 22—1:30 P. M.
Dr. E. R. Van Der Slice, Presiding

1:30 P. M.—Principles of Out-Patient Work in a Sanatorium—Dr. Geo. McL. Waldie, Copper County Sanatorium, Houghton, Mich.
Discussion.

1:50 P. M.—Following Up Sanatorium Patients—Dr. Geo. Thomas Palmer, Palmer Sanatorium, Springfield, Ill.

2:15 P. M.—Does Childhood Tuberculosis Require Hospitalization?—
Proponent—Dr. C. L. Hyde, Springfield Lake Sanatorium, East Akron, Ohio.
Opponent—Dr. C. A. Stewart, Associate Professor of Pediatrics, University of Minnesota, Minneapolis, Minn.
Discussion.

3:00 P. M.—Is the Sanatorium a Safe Place for Nurses?—Dr. E. S. Mariette, Glen Lake Sanatorium, Oak Terrace, Minn.
Discussion.

3:30 P. M.—Is a Good History 50 per cent of the Diagnosis in Tuberculosis? (With charts.)—Dr. Oscar Lotz, Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis.
Discussion.

4:00 P. M.—(A) Tuberculin Reaction—What Is It?
(B) Does a Positive Reaction to Tuberculin Mean More Than Infection with Tubercle Bacilli? —Speaker to be determined.
Discussion.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The tenth anniversary session of the American Congress of Physical Therapy will be held October 5, 6, 7, 8, 1931, at the Hotel Fontenelle, Omaha, Nebraska. Appreciating the desirability of clinics and clinical demonstrations, the program committee has set aside the mornings for these purposes. It will be the first time that the society will have available ample clinical material for medical and surgical services. The coöperation of the University of Nebraska College of Medicine and the Creighton University School of Medicine has made this possible. In the section on Eye, Ear, Nose and Throat, tonsil clinics will be conducted daily during the first three days of the meeting. Electrosurgery for tonsils has found a definite place in the armamentarium of many surgeons. Prominent specialists will demonstrate the various methods and technics now being employed.

The subject of fractures will be thoroughly covered in the surgical clinics. Leading orthopedic surgeons will demonstrate every phase of the work, emphasizing the indications and contraindications for physical therapy.

In the medical section and in the medical clinics every allied specialty is represented. The subject of pneumonia will be adequately discussed, as will such subjects as come in the fields of pediatrics, gastroenterology and dermatology. Massage, therapeutic exercise and hydrotherapy will be presented by specialists in those fields.

The scientific papers will be read during the afternoon sessions. The unusually wide range of subjects and the meritorious papers which will be presented make this program an outstanding one.

The progressive physician who is desirous of keeping abreast of the times can no longer neglect his attendance at a meeting such as this one. Physicians desirous of having their technicians and assistants acquaint themselves with the newer developments in physical therapy are invited to have them attend this four-day scientific meeting. For preliminary program and other information write to the American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

INTER-STATE POST GRADUATE MEDICAL MEETING

The annual International Assembly of the Inter-State Post Graduate Medical Association of North America will be held in Milwaukee October 19 to 23 inclusive.

The preliminary program of morning, afternoon, and evening clinics and addresses contains the names of distinguished physicians and surgeons for the most part professors or associate professors of medical schools in Canada and the United States. The program this year does not include the names of any foreigners. Many names not noted on previous programs appear.

All the specialties in medicine are covered in the subject material and attendance at the services will prove of great value no matter what phase of medicine one may be interested in.

SCOTT-CARVER COUNTY SOCIETY

The annual meeting of the Scott-Carver County Medical Society was held at Shakopee, Minnesota, on Tuesday, June, 9, 1931. Dr. Gardner of St. Paul gave an interesting talk on "Bronchoscopy in the Removal of Foreign Bodies from the Bronchi and Esophagus." Dr. F. E. B. Foley, also of Saint Paul, gave a very comprehensive talk on "Obstructions at the Ureteral-Pelvic Junction." Both talks were illustrated with lantern slides.

The following officers were elected to serve for the year 1932: President, Dr. W. S. Emmerson, Mayer; vice president, Dr. H. M. Juergens, Belle Plaine; secretary-treasurer, Dr. C. F. Cervenka, New Prague; delegate, Dr. H. A. Schneider, Jordan; alternate delegate, Dr. B. H. Simons, Chaska; censor for three years, Dr. H. E. Wunder, Shakopee.

WRIGHT COUNTY SOCIETY

The second quarterly meeting of the Wright County Medical Society was held at Annandale, Minnesota, on Friday, April 10, 1931, at 3:00 o'clock P. M.

Dr. W. A. Fansler, Minneapolis, gave a short talk and a clinical demonstration of the Treatment of Hemorrhoids. A great deal of interest was shown by the local men in this type of treatment.

The other speaker, Dr. R. R. Sullivan, member of the State Board of Health, gave a talk on syphilis and gonorrhea, and illustrated his talk by several reels of moving pictures, illustrating the male urogenital anatomy—when normal and when infected. His talk aroused a great deal of comment and the various methods of treating venereal diseases were discussed pro and con. It was brought out very clearly that the usual method of treating gonorrhea is detrimental to the patient. It was also brought out that the gonoccocus vaccine is only useful as a provocative and has no place as a curative.

This was one of the most interesting meetings ever held, and a larger attendance than we have had for some time.

The following were visitors: Drs. K. A. Walfred, Cold Springs, Minn.; R. N. Jones, St. Cloud, Minn.; Dr. Olsen, Cokato, Minnesota, and Dr. A. Ridgway, South Haven, Minn.

A short business meeting was held in which Dr. L. Bendix' application to membership was accepted.

C. L. Roholt, M.D., *Secretary.*

MINNESOTA MEDICAL ALUMNI ASSOCIATION HOMECOMING PROGRAM

A Homecoming Program similar to the one so successfully given two years ago by the Minnesota Medical Alumni Association will be given this year, on October 30, the day preceding the Homecoming football event

The complete program will appear in our October number. The tentative program includes the following

Dr. E. Starr Judd, President of the American Medical Association: "The Present Status of Surgery of the Gallbladder."

Dr. S. Marx White, President of the American College of Physicians: "Unimportant Heart Murmurs."

Dr. T. J. Kinsella: "Thoracic Surgery."

Other speakers will be: Dr. Irvine McQuarrie, Dr. John Butler, Dr. C. Nauman McCloud, Dr. J. M. Hayes, Dr. J. R. Aurelius, Dr. R. E. Scammon, Dr. J. C. McKinley.

The business meeting of the Alumni Association will be held at noon, at which time the Millard Memorial will be dedicated.

The program should attract as large an attendance as two years ago.

Dr. James S. Carey, 1009 Nicollet Avenue, Minneapolis, is Chairman of the Executive Committee.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. W. A. Lee, Fergus Falls
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

The Auxiliary to the Minnesota State Medical Association is swinging into the work of a new year under the leadership of Mrs. James Blake of Hopkins, and the newly elected officers and committee chairmen of departments of work appointed by Mrs. Blake.

There are twenty-three Auxiliaries covering fifty-four counties. The county presidents are: Blue Earth, Mrs. A. E. Sohmer, Mankato; Camp Release, Mrs. J. S. Kilbride, Canby; Hennepin County, Mrs. Martin Nordland, Robbinsdale; McLeod County, Mrs. Thomas J. Trutna, Silver Lake; Meeker County, Mrs. A. W. Robertson, Litchfield; Mower County, Mrs. A. W. Allen, Austin; Nicollet-LeSueur, Mrs. Joseph O. McKeon, Montgomery; Olmsted County, Mrs. M. S. Henderson, Rochester; Park Region, Mrs. C. O. Estrem, Fergus Falls; Ramsey County, Mrs. W. H. Hengstler, St. Paul; Red River Valley, Mrs. B. C. Bernard, Thief River Falls; Redwood-Brown County, Mrs. Wm. A. Meierding, New Ulm; Rice County, Mrs. M. L. Mayland, Faribault; Scott-Carver County, Mrs. B. H. Simons, Chaska; Stearns-Benton, Mrs. Werner Hemstead, St. Cloud; Steele County, Mrs. A. B. Hart, Sr., Owatonna; St. Louis County, Mrs. F. N. Knapp, Duluth; Southwestern Minnesota, Mrs. L. Sogge, Windom; West Central, Mrs. Charles Bolsta, Ortonville; Washington County, Mrs. Wilfred Hewson, Stillwater; Wright County, Mrs. John Catlin, Buffalo.

"The word 'Auxiliary' is defined by the Standard Dictionary as 'giving or furnishing aid or support, especially in a subordinate or secondary manner supplementary accessory,'" says Mrs. Blake. "I take the liberty of presenting this definition because it so well expresses the real objects and purposes of the work of the Auxiliary, and at the same time so definitely states the limitations of our work.

"Joining and taking an active part in the Women's Auxiliary could very well be ranked as the first activity which any physician's wife should assume outside her home. The immediate welfare of physicians and their families and the future of medical practice depend upon what the public thinks and does with regard to medical practice and health activities. Organized medicine exists largely for the scientific advancement of its members, the betterment of the profession, and proper guidance of health activities. Except for scientific education, practically every purpose of organized medicine needs the assistance of a Woman's Auxiliary. The work of our County Auxiliaries runs along three definite lines—educational, social and philanthropic—and many times we find the first and third combined."

The National Convention of the Woman's Auxiliary to the American Medical Association, held in Philadelphia in June proved a success in every way. Over 1,100 women were registered and attended the three general meetings, and State presidents from thirty-seven states gave reports of their activities, social, philanthropic, and educational. The latter proved the most important activity as every one sensed the need of a public educated to the ideals of Organized Medicine. Many states were advocating student loans.

Dr. Joel T. Boone, Mr. Hoover's physician, and Dr. E. Starr Judd spoke at the Woman's Auxiliary luncheon. At a joint meeting with the A. M. A. we heard the address of the new A. M. A. president, Dr. Judd, from our own State.

Members of the Auxiliaries of Pennsylvania, Delaware and New Jersey were hostesses at various places: Valley Forge, Longwood, Atlantic City, Delaware River, historic Philadelphia, and at the President's reception.

Mrs. Walter Jackson Freeman, Convention Chairman, is to be congratulated on the efficiency with which her committee handled the convention, and the comfort and pleasure with which the large number of visitors were entertained during their stay in hospitable Philadelphia.

CAMP RELEASE AUXILIARY

The women's auxiliary to Camp Release Medical Society met at Ramsey Park, Redwood Falls, on Friday, July 31. Mrs. J. S. Kilbride of Canby, President, presided at the business session. It was voted to have a speaker at the next meeting of the Auxiliary. Mrs. H. T. Foshager, Clara City, and Mrs. W. N. Lee, Madison, were named on the Publicity Committee; Mrs. A. B. Mitchell, Hector, and Mrs. Hauge on the Legislative Committee, and Mrs. Cress and Mrs. Duncan on the Public Health Committee.

The following doctors were named by the Camp Release Society as members of the Advisory Board for the Auxiliary: Dr. L. S. Jordon, Granite Falls, Dr. L. G. Smith, Montevideo, and Dr. E. Flynn, Redwood Falls.

A picnic supper was served to the Auxiliary members and the members of Camp Release Medical Society at six o'clock.

SCOTT-CARVER AUXILIARY

Scott-Carver Auxiliary met at Norwood, Wednesday, August 5, with Mrs. E. J. Eklund as the hostess. Mrs. Hesselgrave, Mrs. Schons and Mrs. Blake were guests. Talks of general interest to the group were the feature of the meeting and all enjoyed a delicious lunch. Scott-Carver Auxliary is growing—new members were welcomed by the President, Mrs. Simons of Chaska and the State President, Mrs. Blake.

THE PARK REGION DISTRICT AUXILIARY

The Women's Auxiliary to the Park Region Medical Society met with their husbands July 15, at the Ottertail County Sanatorium where they were entertained at a delicious dinner by Dr. and Mrs. Broker. At the business meeting the following officers were elected: President, Mrs. C. O. Estrem, Fergus Falls; vice president, Mrs. P. Boyeson, Pelican Rapids; treasurer, Mrs. W. S. Broker, Battle Lake; secretary, Mrs. W. A. Lee, Fergus Falls.

WASHINGTON COUNTY AUXILIARY

The Washington County Medical Society and Women's Auxiliary held their annual picnic on Thursday evening, July 9, on the beautiful grounds of Lakeview Memorial Hospital. A picnic basket was packed and sent to one of our honorary members, Mrs. E. E. Wells.

THE INSOLOID (INSUROL) FRAUD

For the past year or two, there has been exploited from New York City and Bridgeport, Conn., a particularly vicious piece of quackery directed against diabetics. The nostrum involved was known, first, as Insurol and was sold by Officinal Products, Inc., of 276 West 43rd St., New York City. The advertising stated that Insurol Tablets "combined insulin with the actual substance of the pancreas gland" and they were described as "a triumph of German's biochemical laboratories." Later, the name of the concern was changed to the Insurol Company of America, Inc. About the time that this change was made, there was also a change in the name of the product from Insurol to Insuloid and the public was told, in effect, that Insuloid was merely a new name of Insurol. The facts were that the products were entirely different. Insurol Tablets were keratin-coated and contained animal tissue (probably derived from the pancreas). They did not contain boldo, jambul, myrtillin, bean-pod tea, or lithium benzoate. Insuloid, on the other hand, was an uncoated tablet and contained all of the products just named, except pancreatin. It did not contain insulin. Government experts introduced uncontroverted testimony to show that neither Insurol tablets nor Insuloid tablets would cure diabetes and that neither was a substitute for insulin administered hypodermically. The Post Office authorities issued a fraud order against the Insurol Company, Inc., H. C. Young, President and Official Products, Inc., Otto Probst, Manager, at New York City and Bridgeport, Conn. (Jour. A. M. A., July 4, 1931, p. 47.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg.
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

THE SUPPURATION OF THE PETROUS PYRAMID: Pathology, Symptomatology, and Surgical Treatment: S. J. Kopetzky and Ralph Almour. (Ann. Ophthal., Rhinol and Laryng., Part I—39, Dec., 1930, p. 996; II—40, March, 1931, p. 157; III—40, June, 1931, p. 396). A new clinical entity is described. Experience with otitic and mastoid lesions that have been followed after the usual therapy, by an almost symptomless period—then a terminal meningitis, led the authors to view with a new concern, the symptoms of this quiescent period before the terminal symptoms appeared. The significance of the possibilities of a pneumatized petrous process and the symptoms of extension of infection to this area became evident.

Three avenues of invasion of the petrosa seem probable:

1. From the antrum or epitympanic space above or below the superior semicircular canal following the posterior superior wall of the petrosa into the pyramidal tip. 2. From the peri-tubal cells into the pyramidal tip. 3. From the peri-tubal cells directly into the carotid canal and then rupturing in the cavum meckeli.

The symptoms of petrous tip suppuration are divided into four periods:

I. Period of eye pain and aural discharge.

A persistent pain, orbital in location, must be caused by a lesion in direct proximity to the ophthalmic branch of the fifth nerve, for it has no sensory connection with other nerves in the petrosa. When surgical removal of the purulent focus in a mastoid process and middle ear does not result in the cessation of pain distributed over areas supplied by the second and third branches of the fifth nerve, the persistence of pain should be viewed as suspicious of a petrosal tip suppuration when it is continuous in nature and not of a spasmodic type.

In the authors' cases, either the middle ear continued to discharge until the lesion in the petrous tip was identified and eradicated, or else after the period during which the ear was dry, a profuse discharge suddenly reappeared at the same time as or shortly before the onset of the eye pain. (The authors suggest that explanation is offered of those cases of chronic suppurative otitis media associated with a normally pneumatized mastoid process, wherein the squamous epithelium plays no rôle, either in the cause or cure of the lesion. Wittmaack's work, to which the authors subscribe, explains the chronic otorrhea in cases where the factors of sclerosis and epithelium apply).

Other symptoms during this period were: facial weakness and vertigo and nystagmus in two cases, vomiting in several.

II. The period of low grade sepsis.

The temperature was low in the morning, usually between 99 and 100 degrees; toward late afternoon it would rise to 101 or 102.

III. The period of quiescence.

This averaged in the authors' cases between five and nineteen days. It was characterized by an absence of pain.

IV. The treminal period.

This presents in the main a clinical picture of an acute purulent leptomeningitis.

The information that the laboratory furnishes is negligible. Only the X-ray can be used to decided advantage.

The authors' surgical treatment of petrosal tip suppuration consists of, first, a simple mastoidectomy, then inspection of the area beneath the posterior semicircular canal leading toward the jugular bulb and in the region of the solid angle. An endeavor is made to find the point of invasion which characteristically appears as a fistulous opening with granulations around the mouth. If it is probed, a flow of pus almost always follows. A radical cavity is then completed, and, following the toilet of the middle ear, the inner wall of the antrum and epitympanic space are searched for a fistulous opening leading into the petrosa. The areas to be inspected particularly are the spaces directly in front of and behind the superior semicircular canal. The over-hanging anterior external auditory canal and zygomatic root are removed and the anterior wall thinned down with a burr without opening into the glenoid fossa. The zygomatic root is then further removed to a level with the tegmen tympani. The housing of the tensor tympani muscle is removed. An entrance by burr is then made into the petrous process between the eustachian tube, cochlea, and carotid canal. The line of direction corresponds to a line drawn from the apex to the basal whorl of the cochlea.

(To be continued)

Lawrence R. Boies.

PHYSICAL THERAPY IN THE TREATMENT OF DISEASES OF THE EAR, NOSE AND THROAT: T. H. ODENEAL, M.D., Beverly, Mass., (Arch. of Otolaryn., July, 1931, Volume 14, Number 1). In this article the author admits having wasted considerable time in experimenting with physical therapy in practically all the conditions in which these measures have been recommended, and follows by giving his experiences and results.

Diathermy is first taken up, and has been used by him principally in removing superficial growths about the face, and in the coagulation of tonsils. The latter subject is, of course, of considerable interest at the present time, due to the constant propaganda which has appeared in the public press on its behalf. He condemns desiccation of the tonsils as being too tedious and time-consuming to be worthy of attention, but claims that coagulation has given satisfactory results if patiently carried out. It is his custom to coagulate each tonsil on alternate occasions at least six times, and says that the result leaves a throat which appears smooth, and (as far as can be seen) the capsule is destroyed. He says that post-operative bleeding is as a rule very slight, but that on two occasions she has had severe hemorrhages following the separation of the slough, one of which necessitated suturing of the tonsil and pillar.

A warning is given not to mislead patients by telling them that the throat will not be sore after coagulation. If there is no soreness, that treatment has been valueless. Some patients complain bitterly of this soreness, whereas, others state that it is not severe.

In conclusion he states that while he coagulates a great many tonsils, his method of choice is still use of the knife, and this advice he always gives to his patients, unless there is some very valid reason why it cannot be done.

Under a heading of Medical Diathermy, his results would seem to indicate that it is of definite benefit, in certain cases of loss of hearing, as well as exudative types of otitis media. It is not employed by him in chronic suppurative otitis media. In acute rhinitis it seems to be of extinct benefit, as it also is in chronic infections of the ear canal.

Ultraviolet Light. Ultraviolet light seems to arouse very little enthusiasm on the part of the author. He claims it is of no value, whatever, in chronic suppuration of the ear, unless there is a very large perforation through the drum membrane. Neither has he had any permanent result from its use in diseases of the nose and accessory sinuses. The result in hayfever has been practically negative, and this is also true in vasomotor-rhinitis.

However, irradiation of the entire body with the air-cooled lamp seems to be definitely beneficial in cases of sinus disease in children, by reason of its general tonic effect on the body. Care must be used not to overdose the patient.

In Diseases of the Throat, Vincent's Angina, and tubercular-laryngitis, occasionally good results are achieved.

Galvanism is mentioned, and seems to find its best application in the removal of varicosed vessels of the skin of the face. It is also of some value in so-called neuralgia pains.

The Infra-Red Light applied in sinus diseases, especially in acute infections of the frontal sinuses, gives good results in the relief of pain. This he believes, however, to be due principally to the heat generated by the lamp. The same is true in inflammatory conditions of the eye, such as iritis and acute glaucoma.

His experience with the Kinesiphone and audotor, as mechanisms to relieve deafness, has been almost uniformly disappointing.

The whole article gives one the impression of a fair-minded report by a man who has been willing to devote sufficient time and energy to this type of experimentation, and has based his report on first-hand knowledge.

M. W. Wheeler, M.D.

RETROBULBAR OPTIC NEURITIS ORIGINATING IN THE NASAL SINUSES—A new method of demonstrating the relation between the sphenoid sinus and the optic nerve: Harris H. Vail, M.D., Cincinnati, (Arch. of Otolaryngol., June, 1931, Volume 13, Number 6). This worthwhile article is so well summarized by the author, that his summary is being quoted verbatim.

1. A brief résumé of the literature quoted by Canuyt, Ramadier and Velter would seem to show that retrobulbar optic neuritis of nasal origin has been recognized for several centuries.

2. The pathologic studies of Professor Herzog, of Inssbruck, are quoted, and his belief is emphasized that they will explain in every way the mechanism of the production of retrobulbar optic neuritis from posterior nasal sinusitis.

3. Statistics of various authors are quoted to show that the incidence of retrobulbar optic neuritis originating in the nasal sinuses varies according to the particular author's acceptance or denial of a nasal sinus etiology of retrobulbar optic neuritis.

4. A series of fifteen cases of retrobulbar optic neuritis of nasal origin seen by me are tabulated.

5. An important observation is made, namely, that when the onset of blindness was acute and could be definitely dated, it was always noticed after awakening from sleep. The position of the head in sleeping favors the gravitation of infection to the upper outer angle of the sphenoid sinus where the optic nerve is in closest relation.

Table 8.—Final Visual Acuity

	No Operation (6 Cases)		Operation (9 Cases)		
	No Treatment	Recovery Vision 20/25 or Better	Complete Recovery Vision 20/20	Vision 20/30	Slight Improvement; Vision 20/100 or Less
Cases	3*	3	7**	1	1***
Per cent	50	50	77	11.1	11.1

*One of these patients (the recurrent case) would not consent to operation.

**This includes one of the bilateral cases; vision in one eye was 20/20; in the other, 20/100.

***This does not include one of the bilateral cases; vision in one eye was 20/100; in the other eye, 20/20.

6. Statistics are quoted to show that the ocular symptoms constitute an early indication of multiple sclerosis in only 14 per cent of the cases, and the opinion is stressed that the virus of multiple sclerosis may gain entrance to the central nervous system from the sphenoid sinus in the same way that organisms have been shown to do. If this is a fact, it would immediately indicate that an early operation on the posterior sinuses should be performed in cases of multiple sclerosis.

7. A new method is described of roentgen visualization of the relations between the optic canal and the sphenoid sinus by means of filling the sinus with radiopaque oil and so placing the patient's head that the upper outer angle of the sinus is dependent. Thus, the radiopaque oil comes into contact with the boundary of the sphenoid sinus where it is most closely related to the optic nerve. In no other position can this be shown.

Lucian G. Culver, M.D.

THE ROENTGEN FINDINGS IN SUPPURATION OF THE PETROUS APEX: Henry K. Taylor (Ann. Ophthal., Rhinol. and Largng., 40, June 31, p. 367). This presentation is based on the clinical work of Kopetzky and Almour; the roentgen findings were verified at operation.

It is routine now on their service to include in addition to the stereoscopic examination, a base plate and an anterior oblique projection of each petrous pyramid. The two latter are for reference. The author recommends for this examination the use of a fine focus tube, a small or medium sized cone, intensifying screens, and the Potter-Bucky diaphragm.

Position for the base plate: The patient is supine, with head lower than the remainder of the body and rests on the vertex, so that a line drawn through the auditory meatus and superior orbital margin is parallel to the table. The sagittal plane of the head is perpendicular to the table; the plate is horizontal. The tube is tilted upward 15 to 20 degrees, so that the central ray is in the midline, one inch in front of the auditory meatus.

Position for the anteroposterior oblique projection of the pyramid: The patient is supine and the head rotated 45 degrees to the side opposite the one to be radiographed. The chin is pulled in. The film is horizontal. The central ray is perpendicular to the film and passes through a point one inch above the external angle of the uppermost orbit.

Interpretation: There is a slight diminution in aeration of a pneumatized petrosa in the presence of an acute otitis media or mastoiditis. One of the earliest findings in petrosal tip suppuration is a marked diminution in aeration with loss of trabeculations followed by decalcification or atrophy of the apical portion, the contour of the apex remaining intact. With progression, there is perforation and destruction of the contour of the apex.

Lawrence R. Boies.

MEDICINE

TUBERCULOSIS ABSTRACTS*

Atelectasis is defined as imperfect expansion of the lung. The condition is usually considered to be due to a gross obstruction in, or compression of, one of the larger bronchi, which prevents the expansion of the distal alveoli and causes their collapse. Several recent articles point out that atelectasis is a frequent occurrence in pulmonary tuberculosis and that it accounts for many of the physical and X-ray signs usually attributed to the tuberculous lesions. An understanding of the mechanism of atelectasis in pulmonary tuberculosis helps to clear up many of the puzzling phenomena of physical signs which cannot logically be accounted for by the existing pathology.

Atelectasis in Pulmonary Tuberculosis

Atelectasis in pulmonary tuberculosis may be caused in a number of ways. Tubercle bacilli commonly lodge in the terminal bronchioles where ciliated epithelium is not present and there tubercles are most likely to develop. The alveoli, or air cells, distal to the terminal bronchioles collapse and eventually become indurated. Large bronchi are also frequently invaded by the tuberculous process and produce atelectic areas distally. Extensive atelectasis is of common occurrence in chronic, fibroid tuberculosis, due to occlusion of bronchi by scar tissue or caseous material. Large tuberculous lymph nodes may, by pressure on the trachea or bronchi, cause patches or even extensive masses of atelectasis.

Apart from bronchial occlusion, there are other factors which favor atelectasis. In tuberculous lesions, particularly cavities, the air exchange is poor and the air pressure in cavities may be greater than the atmospheric pressure. Lobules supplied by bronchi intercepted by such cavities are likely to be collapsed. Atelectasis is probably favored also by the methods of treating tuberculosis; extended rest in bed, breathing with little effort, avoiding cough.

X-RAY SIGNS OF ATELECTASIS

A characteristic anatomical finding in pulmonary tuberculosis is the small lung with elevated diaphragm and displacement of the mediastinum to the affected side. The diminution in size of the lung and the visceral displacement are not caused by contracting fibrous adhesions, for these changes are frequently observed early in the process before adhesions of any extent could form. Moreover, these findings also occur in types of tuberculosis that are not usually associated with fibrosis (miliary and pneumonic).

Bushnell finds displacement of the heart a very early sign and a delicate index of the existence of disease of the lungs. Norris finds a decrease in size of the entire hemithorax in unilateral, early tuberculosis. By fluoroscopic examination of cases with unilateral tuberculosis, the mediastinum is seen to move pendulum-wise toward the affected side during deep inspiration and back to the normal side during forced expiration. These and other observations indicate that the contracted lung of tuberculosis and visceral displacement are not always due to adhesions but are more often a manifestation of airlessness of the affected lung.

PHYSICAL SIGNS OF ATELECTASIS

Contraction of the affected side and restricted mobility are observed by mensuration and by inspection in early cases of tuberculosis. By percussion can be demonstrated signs of contraction of the entire lung, elevation and small excursions of the diaphragm. The earliest findings by auscultation are impairment or absence of the vesicular murmur and the gradual establishment of the bronchial murmur. Atelectasis accounts for or explains these changed breath sounds.

In more advanced lesions, physical signs become more pronounced; râles appear, and the mediastinal displacement comes into evidence. One of the most important signs in tuberculosis is the finding of râles during inspiration immediately following the expiratory cough. Such râles are due to the opening and closing of collapsed air passages as a result of forced breathing. As a tuberculous process becomes arrested, the atelectic areas show the presence of an increased amount of fibrous tissue; the alveoli are then permanently collapsed and râles can no longer be elicited.

The characteristic physical signs mentioned seem to be due to atelectasis rather than to the specific tuberculous infiltration.

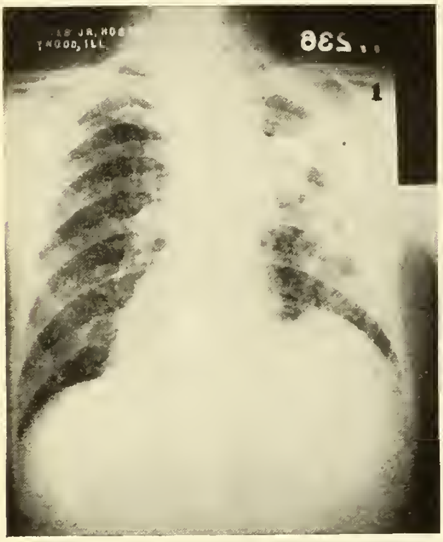
THE MECHANISM OF ATELECTASIS IN TUBERCULOSIS

In the newborn, the lungs completely fill the chest and the intrapleural pressure is equal to the atmospheric pressure. As development proceeds, the chest grows more rapidly than the heart and lungs, which causes the intrapleural pressure to become negative. Decrease of the lung volume in atelectasis or cicatrization further increases the negative pressure in the intrapleural space on the affected side. This causes a displacement of the mediastinum to the affected side. For the same reason, the diaphragm on the affected side is elevated by the abdominal pressure.

---

*Reprinted from Tuberculosis Abstract, a review for physicians, issued monthly by the National Tuberculosis Association, September, 1931, Vol. IV, No. 9.

Atmospheric pressure on the outside of the chest causes the crowding of the rigs, the deviation of the sternum, and the curvature of the spinal column. These abnormalities are more pronounced during inspiration because the intrapleural pressure is further lowered during this phase of inspiration since the collapsed lung cannot inflate sufficiently to fill the created space. During forced expiration, the conditions are reversed and the increased intrathoracic pressure is spent not in deflating the lungs but rather in displacing the mediastinum, which explains its pendulum movement.



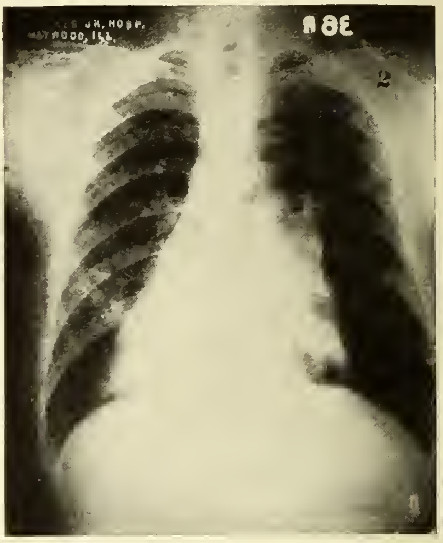
Tuberculosis of right lung. The right hemithorax and lung are contracted; the heart and trachea are displaced to the right and the diaphragm is elevated on this side.

As the absorption of air from the tissues is a rapid process, the visceral displacement is an early sign in tuberculosis, pneumonia, and in other diseases in which atelectasis occurs.—*Atelectasis in Pulmonary Tuberculosis, Ephraim Korol, Amer. Rev. of Tuberc., May, 1931.*

Treatment of Atelectasis in Pulmonary Tuberculosis

Lobar atelectasis or massive collapse has become a well recognized clinical condition. It is due to bronchial obstruction, complications of chronic pulmonary disease, tumors causing pressure. Glenn believes that lobar atelectasis, when occurring in pulmonary tuberculosis, is usually caused by obstruction of the bronchus to the lower lobe by pressure from a tuberculous lymph node or by contracting scar tissue. In his cases, atelectasis has developed slowly. He admits that none of his cases were bronchoscoped or came to autopsy and that, therefore, exact information concerning the etiological factors is not available.

Textbooks and medical literature give little information concerning the treatment of atelectasis as a complication of pulmonary tuberculosis. Aeration is sometimes restored without treatment. If the collapse has a sudden onset and the patient shows no tendency to hemorrhage, rolling the patient backward and forward with the involved side upward is sometimes effective.



Artificial pneumothorax induced without difficulty. The right hemithorax is normal in size. The viscera are in normal position.

The first patient with atelectasis treated by the author with artificial pneumothorax showed such marked improvement that the treatment was repeated in other cases thereafter. He reports seven cases of lobar atelectasis as a complication of pulmonary tuberculosis.

All seven cases were of the left lower lobe. Six cases were treated with artificial pneumothorax and all were benefited. In at least two cases, the prognosis was changed from unfavorable to favorable. One patient could not be given artificial pneumothorax because the pleural space was obliterated by adhesions. He concludes that atelectasis, when a complication of pulmonary tuberculosis, is not difficult to recognize if the likelihood of its being present is realized, and that artificial pneumothorax is the logical treatment for this condition.—*Massive Atelectasis in Pulmonary Tuberculosis and Its Treatment by Artificial Pneumothorax, E. E. Glenn, Amer. Rev. of Tuberc., May, 1931.*

THE EPITHELIOID CELL: R. S. Cunningham and Edna H. Tompkins (Amer. Rev. of Tuberc., 1931, XXIII, 71). Cunningham, Sabin, Sugiyama and Kindwall found that the characteristic cell of tuberculosis was considerably larger than the average monocyte, and often mononucleated. They also found great numbers of monocytes in association with epitheloid cells in tuberculous tissues. They observed all stages of transitions in type of staining from that characteristic of the monocyte to that characteristic of the epithelioid cell. They found that the Langhan's giant cells contained rosettes similar to those in the epithelioid cells. They formulated the concept that epithelioid cells develop from monocytes as a result of a tuberculous infection. Various investigators have since shown that stimuli other than tubercle bacilli can bring about the production of epithelioid cells, among them phosphatide fractions of tubercle bacilli, yellow phosphorous, nitrogen, oxygen, and carbon dioxide, or simply olive oil or mineral oil. The substances which stimulate the production of epithelioid cells and of Langhan's giant cells apparently act in such a way that the phagocytic of the monocytes becomes decreased, cellular division becomes abnormal, multinucleated forms appear, metabolism becomes disturbed and fatty degeneration takes place.

A. T. Laird, M.D.

PEDIATRICS

PREMATURE INFANTS—A STUDY OF 231 CASES OF PREMATURE INFANTS AT PHILADELPHIA LYING-IN HOSPITAL: W. H. Crawford, M.D., Philadelphia (Arch. of Ped., May, 1931, Vol. XLVIII, No. 5). Premature infants comprise all those born before the end of a full term intra-uterine pregnancy, and are therefore not fully developed. All those whose birth weight is less than five pounds are considered premature. Those with a birth weight between five and six pounds are considered immature, and those above six pounds are mature.

Hess says that a great number of premature infants die, not because their organs lack that degree of maturity necessary to proper functions, but because of early neglect, either through lack of adequate facilities or ignorance of exact methods of feeding and care.

Pediatric care of the normal premature resolves itself into:

1. Conserving body temperatures.
2. Providing suitable food.
3. Avoiding infections.

The cause of prematurity was determined in 91 cases, being: Syphilis 31, twins 26, toxemia 12, placenta prævia five, and others in lesser proportions. Average birth weight was four pounds, and gavage feeding was necessary in 17.4 per cent. Temperature was maintained in all cases by using an enclosed bed heated with electric lamps. Death occurred in 82 cases (35.5 per cent) due principally to: Prematurity, 50 per cent; syphilis, 23.2 per cent; pulmonary infection, atelectasis and intracranial hemorrhage, each 5 per cent.

R. N. Andrews, M.D.

DIE TUBERCULINPFLASTERPROBE—EINE VEREINFACHTE METHODE ZUR AUSFÜHRUNG DER PERKUTANEN TUBERKULINPROBE. N. Malmberg and B. Fromm (Acta Pediat., X:4,433, June, 1931). The authors describe a simple method of applying the tuberculin test percutaneously, which they have used in a series of 745 children in a Stockholm clinic. In the original method, a drop of tuberculin was applied to the skin over the sternum and carefully covered with a small square of adhesive plaster, a second square being applied to an adjacent area as control. After 48 hours the adhesive was removed. The appearance of papules, either distinct or confluent, was interpreted as a positive reaction. They later hit upon the idea of incorporating the tuberculin in the plaster in such a way that a drop was present in each square cm. of adhesive, a special control plaster also being made. In the first series of children, a Pirquet, Moro and tuberculin plaster test were applied simultaneously on different areas and all were read and recorded after 48 hours. In 92 per cent of the 745 cases, the results of the three tests were identical; in the remaining 8 per cent, indications were that the plaster and Moro tests were more sensitive than that of Pirquet. In a later series, the plaster test was applied to children who had been given a Mantoux test previously. A comparison of the results showed a high degree of accuracy in the percutaneous test.

The authors believe that the method described compares favorably with other standard methods, and that it has the double advantage of being simple in technic and of causing no discomfort to the patient. It was found that the tuberculin-plaster did not deteriorate when allowed to remain for a year in a tight container.

Louise G. Frary, M.D.

SINUSITIS IN CHILDREN: Henry A. Reisman, M.D., Jamaica, N. Y. (Arch. of Ped., May, 1931, Vol. XLVIII, No. 5). Sinusitis in children is fast becoming a problem of paramount importance because of its increasing prevalence, the difficulties encountered in diagnosis, the resistance of the sinusitis to treatment, and its many complications and sequelæ.

Accordi, in 1911, stated that it should be regarded as an established fact, when children suffer from frequent attacks of head colds, that some of the accessory sinuses are involved. Marriott states that more than half the children in the hospital wards are under treatment for some form of paranasal sinus infection, regardless of the diagnosis on admission. The presence of an overlooked or untreated sinusitis must undoubtedly be the cause of a great many disappointments following tonsillectomies. Sinusitis should be placed among the group of conditions to be considered when dealing with a child with fever of "unknown origin."

In sinusitis there will be a cough which is usually worse at night. The child is pale, fatigues easily, has frequent colds with evidence of nasal stoppage, and the throat shows evidence of a chronic infection with hypertrophy of the retropharyngeal glands, and one will usually find a postnasal discharge. The X-ray is a most valuable aid in the diagnosis of sinus infections.

The author has been using the high fat and protein and low carbohydrate diet which is being used in his chest clinic, for children suffering from sinusitis. The result of the treatment with the diet in some instances was striking, particularly from the standpoint of weight and general condition. The child should be placed in the hands of a competent laryngologist who has both time and patience for children. If there is any doubt as to whether there is pus in the antrum, it should be irrigated, either through the natural orifice or by way of antrotomy. The author believes, if the vaccine is autogenous, and properly given, the patient undoubtedly develops a greater resistance to nose and throat infections. Rest and prevention of over-fatigue is an important factor in the treatment.

R. N. Andrews, M.D.

BLOOD CHANGES IN ACUTE RHEUMATIC AFFECTIONS OF THE HEART DURING CHILDHOOD. Y. Åkerrén (Acta Pediat. X, 4:473-522, June, 1931). In introducing his study, the author presents two cases of acute polyarthritis in which there was apparently no heart involvement but which later developed a fatal endocarditis. He points out the importance of early diagnosis and the difficulties met with in interpreting physical signs and even X-ray findings in children. In an effort to find an objective test, he made a study of the blood of children suffering from acute heart disease following rheumatic joint affection. Subjects were chosen from the children's clinic of the University, Uppsala.

The most constant change in the blood was found to be an increased velocity in sedimentation of red blood cells. In no case where there were unquestionable clinical symptoms of acute heart involvement was this change absent. Increase in leucokyte and thrombocyte count was not found to be as constant or persistent. A comparison of temperature charts and sedimentation reaction graphs shows the latter to be a more sensitive indicator of the true cardiac condition. Sixteen cases are reported in detail. In one fatal case, there was no fever at all for a long period although the sedimentation increase remained high.

In therapy, bed rest was continued until after the sedimentation reaction had returned to normal. This was found to be fairly successful though fatal recurrences were observed twice, and the author feels that the period of rest should be longer.

Louise G. Frary, M.D.

RAW BASIC FEEDING IN ANOREXIA OF CHILDHOOD: I. Newton Kugelmass, M.D., and Emma L. Samuel, M.S., New York, (Arch of Ped., July, 1931, Vol. xlviii, No. 7). Anorexia is a chronic complaint, universal in apparently well children. The nutritional status of the child with chronic anorexia requires some immediate therapeutic procedure for the arrest of the progressive dystrophy. To await the return of a normal appetitie following the alleviation of the underlying condition causative of the anorexia admits of nutritional degradation of the child. The authors have therefore resorted to the use of a raw, base-forming dietary as an initial means to an end in conjunction with other necessary therapy. They have observed that the gastric offense—decreased motility, decreased hunger contraction, decreased hydrogen ion concentration, decreased emptying time—is common to all children with chronic anorexia irrespective of primary etiology.

The child with chronic anorexia has lost this psychological catalyst to initiate the hunger period, thus making the whole process of taking food very difficult. The psychological distortion in the child may either be hereditary, or acquired in the home, which is a veritable laboratory of psychic offense. The very structure of the child becomes transformed into the asthenic type as the result of unwholesome influence of its daily environment.

The authors have come to appreciate that the essential mechanism of digestion primarily depends on mechanical irritation induced by the food ingested. Loss of appetite in children is not a problem involving primarily inadequate gastric or duodenal juice or enzymes, but rather one of alimentary mechanics.

Offering nothing but raw basic feeding to carefully selected children with chronic anorexia is certainly productive of that type of mechanical irritation which a functionally atonic gastro-intestinal tract needs. The total effect is one of more complete emptying of the alimentary tract, thus favoring the development of more marked hunger contraction and its stimulation of the so-called hunger period.

Foods chosen for the anorexia diet are those in season which are universally eaten raw—the fruit, sound, ripe, well washed; the vegetable, crisp, clean and chilled. No foods are served between meals except fruit juice. Raw milk is served at each meal. No sugar or butter appears in the diet for the week, nor cooked food in any form.

The raw base-forming dietary is effective nutritional therapy for initiating the re-establishment of normal appetite, particularly when correlated with all other indicated therapy.

R. N. Andrews, M.D.

ROENTGENOLOGY

ROENTGENOLOGICAL APPEARANCE OF INTERLOBAR AND MEDIASTINAL ENCAPSULATED EFFUSION IN THE THORAX: Eugene Freedman, M.D., (Radiology, 1931, XVI, 14). Interlobar effusions occur more frequently after a pneumonia than from other causes. The shadow of such an effusion extends from the hilum to the lateral chest wall in a vertical of oblique direction and at different levels of the lung fields, according to which part of the fissure is involved. The size and form of the shadow is manifold depending on the amount of fluid and the compressibility of the neighboring lobes. Usually the lower lobe is compressed and in such cases the upper border of the shadow is sharp and the lower border somewhat less distinct in the postero-anterior view. Small exudates are often band or wedge-shaped and the larger ones are circular. In the lateral view the shadows often overlap the heart, are ribbon or wedge-shaped and have straight or circular but always sharply defined borders. The diaphragm remains in normal position and moves freely. When pneumonia, atelectasis or effusion into the entire pleural cavity are present the roentgenological examination is not very helpful. When gas or air escapes into the interlobar space the appearance may be that of a lung abscess. Marginal pneumonias (involving parts of lobes near the septa) localizing caseating pneumonias and bronchial carcinomata may simulate effusion. Lateral views will exclude lobar pneumonia. Marginal pneumonias and localzied caseated areas have usually only one sharp border. A marked anterior bulging in front of a pneumonia, the shadow of which is seen in lateral view suggests an effusion in front of the pneumonia. Lipiodal injections into the trachea visualize the defects and irregularities of the bronchial contour produced by carcinomata.

Mediastinal pleural effusions are, if serous, mostly tuberculous and if pleural, pneumococcal. The mediastinal pleura becomes involved from the tracheobronchial lymph nodes, the lungs, the pericardium, the thoracic wall or the mediastinum itself.

Anterior mediastinal effusions are represented by ribbon shaped shadows parallel to either the left or right silhouette and producing a double cardiac contour on the diseased side. The posterior mediastinal effusions produced either ribbon shaped shadows running parallel to the left or right borders of the vertebral column or triangular shadows in the cardiophrenic angles. In pericardial effusions the pulsations of the heart can be seen. Rotation of the patient helps to clear the diagnosis. When the lung about a bronchiectasis localized in the cardiophrenic sinus becomes surrounded with consolidated lung (pseudo-empyemic bronchiectasis), the diagnosis becomes very difficult unless lipiodal is used. Exploratory thoracocentesis would be of no value as purulent material might be obtained in any case. Mediastinal tumors, aortic aneurysms, or paravertebral abscesses may cause confusion. The tumors have lobulated contours, the aneurysm may show pulsations and the paravertebral abscess will be accompanied by narrowing of the intervertebral spaces or evidences of bone destruction. Seven cases of interlobar and two cases of mediastinal effusion are reported. These reports are accompanied by reproduction of X-ray films.

A. T. Laird, M.D.

SURGERY

SPINAL ANESTHESIA BY LIMITED INDIVIDUALLY DOSED BELT-LIKE DISTRIBUTION: Prof. Kirschner, Tuebingen (Der Chirurg, July 15, 1931. Vol. 3, No. 14, Page 633). The new thought which Professor Kirschner develops in this article is that by limiting the amount of anesthetic used, and placing it in that bodily segment subject to operation, one can use less anesthetic and avoid some of the complications and dangers of the usual routine methods of spinal anesthesia.

By the new technic, which Professor Kirschner has himself applied in 160 cases, the dose is adapted to the requirement at the time it is given, by watching the distribution of the drug, and limiting it to the amount needed for the particular case.

The two directions in which spinal anesthesia may be counted as a failure, are (1) giving a dangerously larger dose than required, or (2) giving an insufficient dosage for the work in hand.

The author attempts to limit his anesthetic to that segment of the body which is under operation, without causing an anesthesia either above or below that particular segment. The principal features of the new technic are: The position of the patient, head down at an angle of 20 degrees; the injection of air into the subdural space, and the use of an anesthetic solution lighter than the specific gravity of the spinal fluid. He has worked out the solution and gives the formula and description of same, and he has also devised a syringe, which is double-barreled—one compartment for air, and the other compartment for the anesthetic solution. There is also described a spinal puncture needle, which is closed at the end and has a lateral opening.

This method of anesthesia has been used for lower as well as upper extremities, and for breast amputation. In abdominal work, in order to limit the amount of anesthetic put into the spinal canal, Professor Kirschner uses a regional block of the sympathetic nerves in the retroperitoneal space, after the abdomen is open. The drug which he uses is percain, because of its efficiency and duration of anesthesia produced.

His results in the use of this newer technic are as follows:

One can limit anesthesia to the distribution of a definite body segment with a full control of the caudal, as well as cranial extension of the area.

One avoids uncontrollable high distribution of the anesthetic, which might interfere with respiration or circulation.

One avoids the necessity of anesthetizing the lower end of the body.

Thus one has voluntary control over the upward and downward location of the anesthetic. In this way one gets a segmentary anesthesia with the minimum amount of anesthetic.

The dose is fitted to the individual case, by watching its immediate effects before a larger dose is used.

It differs from the lumbar anesthesia of Pitkin in that the lower end of the body is not necessarily anesthetized, since control of the site of the anesthetic is in a lower as well as in an upward direction.

The illustration of the physical conditions as they exist in the spinal column, with the heavy spinal fluid below, the floating fluid in the middle, with air on top, is well illustrated by diagram.

This new technic, worked out by a master surgeon, is of great practical interest in this day, when spinal anesthesia is being extensively used. As has been many times mentioned by those writing on this subject, anyone using spinal anesthesia, and especially a newer technic, should be absolutely versed in the physical, chemical, and physiological conditions under which he is working, before attempting the method.

To the experienced user of this form of anesthesia, any addition which either simplifies or makes safer this valuable form of anesthesia, is very welcome; and therefore the article by Professor Kirschner is a very valuable addition to this subject.

A. E. Sohmer, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

An Introduction to Gynecology. C. Jeff Miller, M.D., Professor of Gynecology, Tulane University School of Medicine, etc. 327 pages. Illus. Price: $5.00, cloth. St. Louis: C. V. Mosby Co., 1931.

Clinical Dietetics. Harry Gauss, M.S., M.D., F.A.C.P., Instructor in Medicine, University of Colorado, School of Medicine. 490 pages. Illus. Price: $8.00, cloth. St. Louis: C. V. Mosby Co., 1931.

American Physicians and Surgeons. Edited by James Clark Fifield. 1,737 pages. Price, $30.00. Minneapolis: The Midwest Company.

Modern Proctology. Marion C. Pruitt, M.D., Associate in Surgery, Emory University School of Medicine, etc. 404 pages. Illus. Price, $8.00. Saint Louis: C. V. Mosby Company.

Bedside Interpretation of Laboratory Findings. Michael G. Wohl, M.D., Associate Professor of Experimental Medicine, Temple University, etc. 321 pages. Illus. Price, $6.00. Saint Louis: C. V. Mosby Company.

Cutaneous X-ray and Radium Therapy. Henry H. Hazen, A.M., M.D., Professor of Dermatology, Medical Department of Georgetown University, etc. 166 pages. Illus. Price, $3.00. Saint Louis: C. V. Mosby Company.

COMMON CONTAGIOUS DISEASES. Philip M. Stimson. 353 pages. Illus. Price, $3.75. Lea & Febiger, 1931.

Here is a notable example of the kind of handbook that one often seeks but seldom finds. It is concise, explicit, complete, up-to-date, and devoid of inconsequential verbiage. The various contagious diseases are discussed adequately, and all of the most recent advances in that field are included. The general set-up of the book makes it attractive and easy to read.

Thomas Myers, M.D.

NEW AND NON-OFFICIAL REMEDIES, 1931, containing descriptions of the articles standing accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1931. Cloth. Price, postpaid, $1.50. Pp. 481 + LVI. Chicago: American Medical Association, 1931.

This volume is the annual publication of the Council on Pharmacy and Chemistry of the American Medical Association giving the latest authentic information concerning those of the newer medicinal preparations found worthy of the consideration and use of the medical profession. Each year the Council scans the general articles under which the various preparations are classified and revises these to conform to the latest and best medical thought.

A glance at the preface shows that a number of preparations have been omitted because they conflict with the rules that govern acceptance, because their distributors did not present evidence to demonstrate their continued acceptability, or simply because the manufacturers have taken them off the market. Important revisions have been made in a number of the general articles and in the descriptions of various preparations. Among the new preparations that have been found by the Council during the past year to be eligible for admission to the book are: Amytal and Pulvules Sodium Amytal, 3 grains, barbituric acid derivatives for use preliminary to surgical anesthesia; Thio-Bismol, quinine bismuth iodide, sodium potassium bismuthyl tartrate, and Tartro-Quiniobine, bismuth compounds for use in the treatment of syphilis; Scillaren and Scillaren-B, preparations containing the squill glucosides; two new cod liver oil concentrates; Synephrine, a new vasoconstrictor, and synthetic thyroxine.

New and Non-official Remedies should be in the hands of all who prescribe drugs. The book contains information about the newer materia medica which cannot be found in any other publication.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

WANTED—Scandinavian surgeon of thorough training and pleasing personality for Northwest clinic group. Possible permanent connection. Address D-142, care Minnesota Medicine.

WANTED—Young internist with X-ray experience for clinic group. Norwegian preferred. No investment required. Address D-141, care Minnesota Medicine.

DOCTOR'S OFFICES FOR RENT—Three good rooms over drug store in down town Minneapolis. Steam heat and hot water in winter. Wide stairway. Good location. Reasonable rent. Address D-144, care Minnesota Medicine.

CAPABLE X-RAY LABORATORY and PHYSIOTHERAPY TECHNICIAN wishes employment. Three and one-half years' experience clinical and general office duties. References. Address D-145, care Minnesota Medicine.

CAPABLE X-RAY and CLINICAL LABORATORY TECHNICIAN desires position. Available October first. Can do typing and general office work. Excellent references. Address D-146, care Minnesota Medicine.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

EXAMINATION REPORT, MAY 4, 1931

(April)

CANDIDATES BY EXAMINATION

Name	School and Date of Graduation	Address
Arneill, James Rae, Jr.	Yale, M.D., 1929	Mayo Clinic, Rochester, Minn.
Barber, Kent Walker	U. of Pa., M.D., 1928	608 6th St. S.W., Rochester, Minn.
Bosland, Howard Glenn	U. of Minn., M.B., 1930	General Hospital, Minneapolis, Minn.
Broadie, Thomas Edward	Indiana Univ., M.D., 1928	Ancker Hospital, St. Paul, Minn.
Callaghan, Desmond Hays	U. of Minn., M.B., 1931	St. Mary's Hospital, Duluth, Minn.
Christenson, Grant Reynolds	U. of Minn., M.B., 1930	304 Harvard St., Minneapolis, Minn.
Cronk, Charles Frederick	U. of Minn., M.B., 1930	Cameron, Wis.
Edwards, Richard Graham	U. of Minn., M.B., 1930	General Hospital, Minneapolis, Minn.
Eneboe, John Bernard	U. of Minn., M.B., 1930	615 S. 1st Ave., Sioux Falls, S. D.
Foor, Clifford Gault	U. of Cincinnati, M.B., 1928; M.D., 1929	Mayo Clinic, Rochester, Minn.
Gaida, Joseph Benedict	U. of Minn., M.B., 1931	St. Mary's Hospital, Minneapolis, Minn.
Gamm, Kenneth E.	U. of Minn., M.B., 1931	1266 Charles St., St. Paul, Minn.
Gerdes, Maude Marguerite	U. of Minn., M.B., 1929; M.D., 1930	Zeeland, N. Dak.
Gifford, Byron Lee	U. of Minn., M.B., 1931	Battle Lake, Minn.
Haugen, John Amberg	U. of Minn., M.B., 1930; M.D., 1931	97 Orlin Ave. S.E., Minneapolis, Minn.
Howell, William Ladelle	Baylor Univ., M.D., 1928	219 6th Ave. S.W., Rochester, Minn.
Jump, Walter Clinton	U. of Minn., M.B., 1931	St. Mary's Hospital, Duluth, Minn.
Lietzke, Erwin Thomas	U. of Minn., M.B., 1930	1515 Charles St., St. Paul, Minn.
Lippman, Elmer Wesley	U. of Minn., M.B., 1930	St. Luke's Hospital, Duluth, Minn.
Lynch, Helen Margaret	U. of Minn., M.B., 1930	Cedar Falls, Iowa
McCann, Eugene J.	U. of Minn., M.B., 1930	General Hospital, Minneapolis, Minn.
McNeely, Celia Alma	U. of Toronto, M.B., 1926	Women's Hospital, Philadelphia, Pa.
Martin, William Joseph, Jr.	U. of Pa., M.D., 1927	Mayo Clinic, Rochester, Minn.
Merrill, Elisabeth	U. of Minn., M.B., 1930	707 Goodrich Ave., St. Paul, Minn.
Mistachkin, Norman Leonard	U. of Minn., M.B., 1930; M.D., 1931	St. Louis, Mo.
Murray, Stephen E.	U. of Pa., M.D., 1928	102 2nd Ave. S.W., Rochester, Minn.
Parsons, Ralph Ludvig	U. of Minn., M.B., 1930; M.D., 1931	Monterey, Minn.
Peterson, Vernon L.	Washington Univ. Sch. of Med., M.D., 1929	932 2nd St. S.W., Rochester, Minn.
Popp, Walter Charles	U. of Pittsburgh, M.D., 1929	718 5th St. S.W., Rochester, Minn.
Rea, Charles Ethan	U. of Minn., M.B., 1930	255 W. George St., St. Paul, Minn.
Simons, Leander Theodore	U. of Minn., M.B., 1930	Chaska, Minn.
Thayer, Ellsworth Albert	U. of Minn., M.B., 1931	2712 Bryant Ave. S., Minneapolis, Minn.
Tifft, Cyril Richardson	U. of Minn., M.B., 1930	St. Mary's Hospital, Duluth, Minn.
Tuohy, Edward Lawrence	U. of Minn., M.B., 1930; M.D., 1931	University Hospital, Minneapolis, Minn.
Weis, Benjamin Anthony	U. of Minn., M.B., 1930	Miller Hospital, St. Paul, Minn.
Whitlock, Merle Eugene	Indiana Univ., M.D., 1929	Mayo Clinic, Rochester, Minn.
Wilson, Viktor Ottman	U. of Minn., M.B., 1930	Ancker Hospital, St. Paul, Minn.
Zachman, Leo Lahr	U. of Minn., M.B., 1930	1253 Grand Ave., St. Paul, Minn.

CANDIDATES BY RECIPROCITY

Name	School and Date of Graduation	Address
Hardgrove, Maurice A. F.	Columbia Univ., M.D., 1928	Mayo Clinic, Rochester, Minn.
McQuarrie, Irvine	Johns Hopkins, M.D., 1921	U. of Minn., Dept. Pediatrics, Minneapolis

CANDIDATES NATIONAL BOARD CERTIFICATION

Name	School and Date of Graduation	Address
Rewbridge, Allan George	Harvard, M.D., 1926	823 Nicollet Ave., Minneapolis, Minn.

EXAMINATION REPORT, JUNE 30, 1931

(June)

CANDIDATES BY EXAMINATION

Name	School and Date of Graduation	Address
Abbott, Clyde Berthold	U. of Minn., M.B., 1930; M.D., 1931	Springfield, Minn.
Anderson, Waldo Paul	U. of Minn., M.B., 1931	1110 Glenwood Ave., Minneapolis, Minn.
Atkinson, Walter	Georgetown U., M.D., 1928	Mayo Clinic, Rochester, Minn.
Bagley, Elizabeth Colville	U. of Mich., M.D., 1927	501 Woodland Ave., Duluth, Minn.
Bulinski, Theodore John	U. of Minn., M.B., 1931	University Hospital, Minneapolis, Minn.
Chancellor, Orville Kelsey	U. of Minn., M.B., 1931	Northwestern Hospital, Minneapolis, Minn.
Crombie, Francis Joseph	U. of Minn., M.B., 1930; M.D., 1931	Miller Hospital, St. Paul, Minn.
Daley, David Micheal	U. of Minn., M.B., 1930; M.D., 1931	Lewiston, Minn.
Frary, Louise Grace	U. of Minn., M.B., 1930; M.D., 1931	5049 Dupont Ave. S., Minneapolis, Minn.
Goldish, Daniel Richard	U. of Minn., M.B., 1931	617 17th Ave. E., Duluth, Minn.
Hinckley, Robert George	U. of Wis., M.D., 1929	1616 6th St. S.E., Minneapolis, Minn.
Kilgard, Ross Miller	U. of Minn., M.B., 1931	5333 Columbus Ave., Minneapolis, Minn.
Lang, Leonard Adam	U. of Minn., M.B., 1928; M.D., 1929	University Hospital, Minneapolis, Minn.

Minor, Walter Jerome	U. of Minn., M.B., 1930; M.D., 1931	909 St. Anthony Ave., St. Paul, Minn.
Noth, Paul Henry	U. of Minn., M.B., 1931	4010 Pillsbury Ave., Minneapolis, Minn.
Oeljen, Siegfried C. G.	U. of Minn., M.B., 1931	St. Luke's Hospital, Duluth, Minn.
Pearson, Bror Folke	U. of Minn., M.B., 1931	1621 7th St. S.E., Minneapolis, Minn.
Quanstrom, Virgil E.	U. of Minn., M.B., 1931	1310 Pine St., Brainerd, Minn.
Robinson, Lloyd Wayne	U. of Colo., M.D., 1929	110 2nd Ave. S.E., Rochester, Minn.
Ruggles, George McCue	U. of Minn., M.B. and M.D., 1930	Asbury Hospital, Minneapolis, Minn.
Schultz, Peter J.	U. of Minn., M.B., 1931	512 Delaware S.E., Minneapolis, Minn.
Skaug, Harold M.	U. of Minn., M.B., 1931	1310 E. 18th St., Minneapolis, Minn.
Smith, Vernon D. E.	U. of Minn., M.B. and M.D., 1931	339 Lowry Med. Arts Bldg., St. Paul, Minn.
Sorteberg, Edward Donald	U. of Minn., M.B., 1931	429 Union St. S.E., Minneapolis, Minn.
Thompson, Floyd Ammann	U. of Minn., M.B., 1931	University Hospital, Minneapolis, Minn.
Thorsness, Edwin Trueman	Marquette, M.D., 1927	Mayo Clinic, Rochester, Minn.
Walsh, William Edward	Marquette, M.D., 1928	Naval Hospital, Great Lakes, Ill.
Watson, C. Gordon	U. of Minn., M.B., 1930	St. Mary's Hospital, Duluth, Minn.
Weed, Vernon A.	U. of Minn., M.B., 1930	916 E. 15th St., Minneapolis, Minn.
Youngs, Nelson A. Miles	U. of Minn., M.B., 1930; M.D., 1931	901 E. River Road, Minneapolis, Minn.

CANDIDATES BY RECIPROCITY

Graff, Richard John	Loyola Univ., M.D., 1930	New Ulm, Minn.
Johnson, Ralph Bernard	Northwestern, M.D., 1929	Lanesboro, Minn.
Killion, John Jackson	U. of Tenn., M.D., 1930	Pine River, Minn.
McElligott, Edmund Wright	Rush, M.D., 1927	Morris, Minn.
Steinberg, Charles Leo	U. of Colo., M.D., 1928	936 Goodrich Ave., St. Paul, Minn.

CANDIDATES NATIONAL BOARD CERTIFICATION

Wilkinson, H. Weldon	U. of Minn., M.B., 1929; M.D., 1930	Mayo Clinic, Rochester, Minn.

Minnesota State Medical Association

Seventy-Eighth Annual Session

Minneapolis, Minnesota

PROCEEDINGS OF THE HOUSE OF DELEGATES FIRST MEETING—MONDAY EVENING, MAY 4, 1931

The meeting of the House of Delegates of the Minnesota State Medical Association, held in the Ball Room of the Nicollet Hotel, Minneapolis, Minnesota, convened at 7:00 o'clock P. M., Dr. L. Sogge, Windom, President of the Association, presiding.

President Sogge: The meeting will please come to order. The following have been appointed on the Credentials Committee: Dr. Wm. C. Carroll, St. Paul; Dr. John F. Fulton, St. Paul, and Dr. W. S. Broker, Battle Lake, which committee will report at this time.

Dr. Carroll: We have examined the credentials of the various delegates, and fifty-nine are present. The following delegates were present:

Blue Earth County—M. I. Howard, Mankato
Blue Earth Valley—J. L. Mills, Winnebago
Camp Release District—M. S. Nelson, Granite Falls
Central Minnesota—H. C. Cooney, Princeton
Chisago-Pine—F. F. Callahan, Pokegama
Clay-Becker—M. C. Bergheim, Hawley
Dodge County—F. D. Smith, Kasson
Freeborn County—W. L. Palmer, Albert Lea
Goodhue County—M. W. Smith, Red Wing
Hennepin County—W. A. Fansler, E. K. Green, J. A. Myers, E. A. Loomis, J. M. Hayes, A. S. Hamilton, Ivar Sivertsen, Chas. R. Drake, Ralph Knight, H. B. Hannah
Houston-Fillmore—Not represented
Kandiyohi-Swift—C. L. Scofield, Benson
Lyon-Lincoln—A. L. Vadheim, Tyler
McLeod County—Not represented
Meeker County—A. W. Robertson, Litchfield
Mower County—O. H. Hegge, Austin
Nicollet-LeSueur—Swan Ericson, Le Sueur
Olmsted County—A. W. Adson, W. F. Braasch, J. E. Crewe, E. S. Judd, L. W. Pollock, W. A. Plummer, A. H. Sanford
Park Region District—W. S. Broker, Battle Lake
Ramsey County—W. C. Carroll, J. F. Hammond, J. C. Hultkrans, Arthur H. Pedersen, E. M. Hammes, John Ryan
Redwood-Brown—Not represented
Red River Valley—H. M. Blegen, Warren; O. E. Locken, Crookston
Rice County—A. M. Hanson, Faribault
St. Louis County—F. H. Magney, Duluth; J. R. Manley, Duluth; B. S. Adams, Hibbing; C. L. Haney, Duluth
Scott-Carver County—F. C. Westerman, Montgomery
Southwestern Minnesota—E. W. Arnold, Adrian; S. A. Slater, Worthington
Stearns-Benton County—J. P. McDowell, St. Cloud
Steele County—A. B. Stewart, Owatonna
Upper Mississippi—C. E. Anderson, Brainerd; F. W. Van Valkenburg, Long Prairie
Wabasha County—D. S. Fleischhauer, Wabasha
Waseca County—B. I. Saliterman, Janesville
Washington County—E. S. Boleyn, Stillwater
Watonwan County—H. B. Grimes, Madelia
West Central Minnesota—B. R. Karn, Ortonville
Winona County—C. P. Robbins, Winona
Wright County—E. Klaveness, St. Paul

President Sogge: The minutes of the last session were printed in the October, 1930, number of Minnesota Medicine, and if there are no objections the minutes will be accepted without being read at this time. A motion was made and seconded that the reading of the minutes of the last meeting be dispensed with and the minutes accepted, which motion, being put to a vote, was carried.

We will now have the report of the Chairman of the Council. Dr. Workman.

MEETING OF THE COUNCIL

The Council of the Minnesota State Medical Association met at noon May 4, 1931. The following were present: Drs. L. Sogge, A. G. Schulze, M. S. Henderson, William A. Piper, H. M. Workman, J. S. Holbrook, F. J. Savage, N. O. Pearce, W. W. Will, O. J. Hagen, W. A. Coventry, George Earl, W. L. Burnap, W. A. Fansler, W. F. Braasch, C. B. Wright, E. A. Meyerding, O. E. Locken, J. R. Manley, H. M. Johnson, S. H. Boyer, F. E. Burch, W. C. Carroll, and H. M. Blegen.

The minutes of the last meeting of the Council held on February 7, were read and approved.

Dr. Locken, Chairman of the Special Committee to Study the Policies of the State Association, presented his report to the Council for its approval. A discussion followed and the report was referred to the House of Delegates.

At 2:00 P. M. the president called to order the meeting of the House of Delegates to abide with Chapter 5, Section I, of the By-laws. The meeting immediately adjourned.

The Council expressed its appreciation to Dr. Locken and the members of his committee for their work.

Mr. Van Riper of the Travel Guild, Incorporated, appeared before the Council submitting a proposition of a coöperative medical European tour to be conducted under the auspices of State Medical Journals. Motion made and seconded that the Council go on record as favoring the plan for Minnesota Medicine subject to the approval of the Editing and Publishing Committee.

The quarterly statement from MINNESOTA MEDICINE was read and approved.

A report of the budget expenditures to date was read.

A report of the Fiscal Agency Account was read and approved.

MOTION made by Dr. Coventry, seconded and carried, that the secretary be instructed to keep the budget expenditures as low as possible for the balance of the year.

MOTION made by Dr. Coventry, seconded and carried, that it be brought to the attention of the Editing and Publishing Committee that its report submitted this year was signed by Mr. Bruce and not by a member of the committee.

MOTION made by Dr. Coventry, seconded and carried, that the lunches for the members of the House of Delegates on Tuesday be paid for by the State Association.

Dr. Workman read a letter written by Dr. Hagen to the Red River Valley Medical Society.

MOTION made by Dr. Savage, seconded and carried, that Drs. C. B. Wright and J. T. Christison be recommended to the House of Delegates for reëlection as delegate and alternate to the American Medical Association for a period of two years beginning January 1, 1932.

A report of the membership was read by the Secretary. There are now 2,006 paid members in the Association.

A list of the affiliate applications to the American Medical Association was read; these were as follows:

S. S. Hall, Minneapolis
E. S. Strout, Minneapolis
E. H. Whitcomb, St. Paul
Chas. A. Van Slyke, St. Paul
Wm. F. Wilson, Lake City
L. K. Onsgard, Houston
Warren Wilson, Northfield

MOTION made by Dr. Pearce, seconded and carried, that the new plan for the certificates bearing the name of the County Society and its secretary be tried out for a year and that they be signed in the State office and sent directly to the membership.

A uniform fiscal year for the component societies was discussed and it was suggested that this matter be brought before the House of Delegates.

The question of redistricting Chisago-Pine and the Central Minnesota Medical Societies was referred to Drs. Savage and Coventry, councilors of the district.

Dr. Meyerding read several letters received by Dr. Johnson from various members congratulating him on the splendid work of the Committee on Public Policy and Legislation.

A question of a Service Medal for worthy members of the Association was laid on the table until next year.

MOTION made by Dr. Coventry, seconded and carried, that the Council endorse the request that the Basic Science Board be authorized to transfer some of its funds to the State Board of Medical Examiners for legal expenses incurred in the enforcement of the Basic Science Law.

A communication from the American Medical Association showed that many of the County Societies have not answered the questionnaire sent to them regarding their public health educational activities. The Councilors were urged to see that the secretaries in their districts answer this form.

MOTION made by Dr. Savage, seconded and carried, that the budget of the Historical Committee be increased to $750.00 as suggested in the report of this committee.

The following recommendation was submitted by the Committee on Public Policy and Legislation:

"TO THE COUNCIL OF THE STATE MEDICAL ASSOCIATION:

The Legislative Committee of the State Medical Association unanimously recommends, that in the publication in the register of the physicians licensed to practice in the State of Minnesota, some designation be made of those individuals who are members of the State Medical Association; provided this is not contrary to law.

H. M. JOHNSON
M. O. OPPEGAARD
C. B. WRIGHT
F. J. PLONDKE
N. G. MORTENSON.

Dr. Manley presented the report of the Reference Committee to the Council.

The meeting adjourned.

PRESIDENT SOGGE: You have heard the reading of the minutes of the meeting held by the Council. What do you wish to do with them?

A motion was made, seconded, put to a vote and carried, that the report be accepted.

PRESIDENT SOGGE: Next is the President's report.

I have no report to make, other than to say that I am very thankful to every member of the Association. It has been a wonderful pleasure to work with you because you do take hold, and when you have a membership that is willing to help and push, things come along very nicely. To expedite matters, because we have a good many things to consider, we thought we would follow this plan tonight: First, a report from the Reference Committee; then the Chairman of the committee will make remarks if he desires; then the subject will be open for discussion. We would like to hear on the floor of the House of Delegates anything anybody has to say. Don't be backward about speaking your opinion, because that is the only way we can learn how to carry out the work of the House of Delegates more efficiently. We have the Reference Committee, but that is simply to help us along—to go a little faster; it does not mean that we want to shut off any discussion. First in order is to head the Reference Committee on the Secretary's report.

REPORT OF THE SECRETARY

The past year has seen a steady increase in the routine work in the secretary's office. We regret to say that the committees, however, have not been as active as in the previous years—that is, their demands for services from the secretary's office have been smaller. Individual members, on the other hand, are learning, more and more, of the service that is available through the secretary's office. This accounts for the increase in the routine.

The demand upon the secretary's time, by the medical profession, has increased materially. During the past year the Secretary, personally, has been required to devote much more time than in the past to the needs of the various committees and local organizations.

NEWSPAPER SERVICE

The number of papers accepting this service has increased during the past year. We believe that its educational and general character has improved also. This is undoubtedly due to the fact that we are now writing our stories in our own office. The total number of papers accepting this service is 300. It is urged that the local physicians call these stories to the attention of their local papers, that they find out when the stories are published, and ask editors who do not publish them, why they are not doing so. All stories are censored by the Committee on Public Health Education.

COMMITTEES

During the past two or three years, our Committees have increased in size and number. It has been suggested that the committees are too large and unwieldy. The experience of the Secretary is that committee membership is always regarded as an honor. It might be advisable, however, to have an Executive Committee of three or five where the committees are large. The size has increased, due to the demand for geographical representation.

SERVICE TO STATE BOARD OF MEDICAL EXAMINERS

The new Medical Practice Act and Basic Science Laws have been so well enforced that a large portion of the members write to this office giving information of violations of these acts. This office has coöperated closely with the State Board of Medical Examiners and wishes to express its appreciation, particularly, of the services rendered by the Secretary of the Board.

COMMITTEE ON HOSPITAL AND MEDICAL EDUCATION

This Committee has been active in the past year in furthering post-graduate education amongst the membership. The Short Courses conducted by the Extension Division of the University of Minnesota have been successful as also were the new series of colloquium lectures. This service is of the highest value to our organization.

PAST PRESIDENTS

During 1930 the then President, S. H. Boyer of Duluth, Minnesota, visited practically every Medical Society in the State at a great expense and inconvenience to himself. Dr. Boyer has now placed himself as a competitor to his predecessor, Dr. C. B. Wright of Minneapolis. Both men were very active.

SEVENTY-SEVENTH ANNUAL MEETING AT DULUTH

This meeting was undoubtedly the most successful from a scientific, business, social, in fact from every aspect that your present Secretary has participated in. The local committees were very coöperative and very hospitable. The total attendance was 667, the largest ever held outside the Twin Cities.

HEADQUARTERS

The present arrangement for coöperation with the Minnesota Public Health Association continues to be of mutual advantage to both organizations. The publication *Everybody's Health,* is conducted on as high an ethical plane as possible.

HEALTH MEETINGS

Speakers have been sent out by the Public Health Education Committee to various parts of the state and to various organizations, such as the Parent-Teacher associations, Women's Federation, et cetera. Health meetings were also conducted, in conjunction with the Minnesota Public Health Association in various parts of the State. Dr. Morris Fishbein talked before three state conventions here last year. Dr. Fishbein addressed at least 20,000 persons during his two days' stay.

SECRETARIES CONFERENCE

The county and district Secretaries meeting was successful as usual. It therefore justifies its existence. Your secretary attended similar conferences in Iowa and Wisconsin.

PUBLIC RELATIONS

Your secretary was asked by the Secretary of the American Medical Association to present a paper last November at the Annual Conference of State Secretaries and Editors in Chicago. This paper was published in the January bulletin of the American Medical Association, and reprints have been sent to the members of our State Association. It should be a part of your Secretary's report to you today.

RADIO PROGRAM

The talks by Dr. W. A. O'Brien, University Hospital, Minneapolis, Minnesota, over Station WCCO are an unqualified success, not only in Minnesota but throughout the Northwest. They constitute one of the best investments that your organization has made.

EXPENSES

The expenses, other than the educational fund, have gradually increased due to the material growth, increased activities and the increase in the number of members taking advantage of the services offered. We have reached the limit of our expenditures. This is to be regretted as one of the most important phases of our educational work, that carried on by the Committee on Public Health Education, of which Dr. George Earl is Chairman, has not yet been thoroughly developed. It is now reaching the stage where more money should be expended. Greater activity is particularly necessary in our campaign for creating better Public Relations. Unless arrangements are made to increase the budget of this Committee the local societies will necessarily be obliged to increase their own activities as far as the public is concerned.

MALPRACTICE INSURANCE

During the past year our Insurance Company, which is the Aetna, made the following unsolicited reduction in their rates:

$10,000 to $30,000	$21.00

This is the basic rate and this form of insurance is written by this company for members of the State Association only. The former rate was $28.00.

The fact that the malpractice situation has improved and that reductions were therefore made possible, is undoubtedly due to our legislative program and condition of organization.

REPORT OF MEMBERSHIP

Name of Society	December 31, 1930	April 23, 1931	Affiliate	Associate	Total
Blue Earth County	30	31	1		32
Blue Earth Valley	23	22	5		27
Camp Release District	46	40	1		41
Central Minnesota District	13	13			13
Chisago-Pine County	19	13			13
Clay-Becker County	15	19	1		20
Dodge County	6	6			6
Freeborn County	18	18			18
Goodhue County	14	15			15
Hennepin County	524	495	23	7	525
Houston-Fillmore County	21	21	1		22
Kandiyohi-Swift County	21	23			23
Lyon-Lincoln County	18	17	1		18
McLeod County	12	13			13
Meeker County	8	9			9
Mower County	23	20	1		21
Nicollet-Le Sueur County	19	18			18
Olmsted County	323	312		1	313
Park Region District	37	38			38
Ramsey County	286	280	17	1	298
Red River Valley	53	52			52
Redwood-Brown County	30	31	3		34
Rice County	31	33	3		36
St. Louis County	176	174	5		179
Scott-Carver County	24	26	1		27
Southwestern Minnesota	53	52	3		55
Stearns-Benton County	42	40	4		44
Steele County	9	10			10
Upper Mississippi	67	61			61
Wabasha County	10	11	2		13
Waseca County	9	8			8
Washington County	13	11			11
Watonwan County	7	8			8
West Central Minnesota	26	24			24
Winona County	24	26			26
Wright County	14	16			16
TOTALS	2,064	2,006	72	9	2,087

DAKOTA MEDICAL SOCIETY

There is none. The Council revoked the Dakota society charter because the physicians of Dakota County failed to comply with its provisions.

FISCAL YEAR OF THE COMPONENT MEDICAL SOCIETIES

At present there is no uniform date when the officers of the Component Medical Societies in Minnesota assume office. There are six dates set for the annual meetings of our thirty-six County Medical Societies. This irregularity makes it impossible for the state office to know who the officers of the component societies are. Frequently months elapse after a meeting before we are informed. It is suggested that the matter of a uniform date be considered. The following survey has been made in our office:

	ASSUMED OFFICE	DATE OF ELECTION
Blue Earth Valley	January	October
Central Minnesota District	January	January
Clay-Becker County	January	December
Dodge County	January	September
Freeborn County	January	December
Goodhue County	January	January
Kandiyohi-Swift County	January	December
Lyon-Lincoln County	January	October
McLeod County	January	January
Meeker County	January	December
Nicollet-Le Sueur County	January	December
Park Region District and County Medical Society	January	October
Ramsey County	January	November
Rice County	January	December
Scott-Carver County	January	June
Southwestern Minnesota	January	November
Upper Mississippi	January	January
Washington County	January	December
Winona County	January	January
Chisago-Pine County	May	May
Redwood-Brown County	May	May
Stearns-Benton County	May	April
Wabasha County	July	July
Camp Release District	October	October
Hennepin County	October	May
Houston-Fillmore County	October	October
St. Louis County	October	October
West Central District	October	October
Wright County	October	October
Olmsted County	November	November
Steele County	November	November
Mower County	December	November
Red River Valley County	December	December
Waseca County	December	December
Watonwan County	December	December

(No card received from Blue Earth County)

REGIONAL CONFERENCE

A meeting of the Northwest Regional Medical conference was held on February 8, 1931, at the St. Paul Hotel, St. Paul. Six states were represented, as follows: Iowa, North Dakota, Wisconsin, South Dakota, Nebraska, and Minnesota. A report of this meeting was published in the April issue of MINNESOTA MEDICINE.

LEGISLATION

We believe that during the past legislative session our Committee on Public Policy and Legislation has accomplished the greatest feat in its history as far as the welfare of the public and medical profession is concerned. The principle which declares that "every citizen has a right to select his own medical attendant" was sustained by the legislature. The set-back sustained in Minnesota by those interested in socialization will necessarily be long enduring.

AUXILIARY

Your auxiliary has made unusual advances during the past year and is becoming an active and valuable aid. The Secretary wishes to compliment the officers of the auxiliary for their activities. The profession, as a whole, should recognize and foster this very valuable service.

CONCLUSION

In conclusion it may be fairly stated that your association is making steadfast progress. It is today in the best condition of its history.

E. A. MEYERDING, *Secretary.*

DR. J. R. MANLEY (Duluth): You all have had a chance to study the Secretary's report. The Reference Committee has this to say: It is a very complete report and gives a comprehensive outline of the work of the Secretary's office. The Refereuce Committee moves its adoption.

PRESIDENT SOGGE: What do you wish to do with the report of the Secretary?

A motion was made, seconded and carried, that the report be accepted.

PRESIDENT SOGGE: Next is the report of the Treasurer.

TREASURER'S REPORT

RECEIPTS

Balance on hand Dec. 31, 1929		$ 1,293.47
Dues, placed to checking account	20,880.00	
Dues, placed to savings account	10,545.00	
Total		$31,425.00
Interest on savings funds	$ 439.46	
Interest on checking account	98.11	
Refund	27.00	
Total		$ 564.57
Bruce Publishing Co., 1929 profits		1,081.52
Bills payable		2,000.00
Total receipts		$36,364.56
Total disbursements		$29,020.57
Balance on hand Dec. 31, 1930		$ 7,343.99

DISBURSEMENTS

Public Health Education Committee	$ 5,899.06
Rent	300.00
Council	352.59
Miscellaneous	1,045.42
MINNESOTA MEDICINE	4,126.00
Bills payable $2,965; interest $35	3,000.00
Annual meeting	1,844.80
Secretaries' Conference	446.73
Furniture and Fixtures	22.61
Stenographers and clerks	1,654.05
Secretary's traveling expenses	603.13
Legal expenses	50.00
Treasurer's salary $100.00; expenses $3	103.00
Secretary's salary	3,600.00
Hospital and Medical Education Committee	215.10
State Health Relations Committee	3.29
Education Committee	5,117.03
Historical Committee	43.98
Printing	221.41
Auxiliary	57.37
Consultation Bureau	300.00
Refund in dues	15.00
Transferred to savings account	6,000.00
Total disbursements and transfers	$35,020.57
Minus transfer to savings account	$ 6,000.00
Total Disbursements	$29,020.57

STATEMENT OF CHECKING ACCOUNT

Balance on hand Dec. 31, 1929		$ 1,293.47
Dues deposited to this account		20,880.00
Interest on checking account		98.11
Interest refund		27.00
Bruce Publishing Co.		1,081.52
Transferred from savings fund—		
July 2,	$5,000.00	
Oct. 1	7,000.00	
Total		$12,000.00
Bills payable		2,000.00
Total receipts for checking account		$37,380.10
Total disbursements and transfers		35,020.57
Total in account on Dec. 31, 1930		$ 2,359.53
Outstanding checks Dec. 31, 1930:		
Nos. 396, 398, 403, 405, 408		655.56
Bank Balance on Dec. 31, 1930		$ 3,015.09

STATEMENT OF SAVINGS ACCOUNT

Balance on hand Dec. 31, 1929		None
Dues deposited to this account		$10,545.00
Interest April 1	$105.45	
July 1	166.50	
Oct. 1	118.16	
Dec. 31	49.35	
Total		439.46
Transferred from checking account		6,000.00
Total		$16,984.46
Transferred to checking account:		
July 2	$5,000.00	
Oct. 1	7,000.00	
Total		12,000,00
Balance in savings fund		4,984.46
Balance in checking fund		2,359.53
Total balance on hand Dec. 31, 1930		$ 7,343.99

The above balance of $7,343.99 on hand December 31, 1930, represents $2,000.00 Bills Payable which must be paid for immediately after the first of the year, and it represents $750.00 in 1931 dues collected before December 31, 1930. Deducting these sums we have a true balance left of $4,593.99.

A. G. Schulze, *Treasurer.*

Dr. Manley: The Reference Committee approves this report and moves its adoption.

Thereupon the report of the Treasurer was adopted.

President Sogge: Now comes the report of the Delegates to the American Medical Association.

Dr. W. F. Braasch (Rochester): We reported last year as the Duluth meeting came right after the meeting of the American Medical Association in Detroit. We have nothing further to report.

President Sogge: Dr. Wright will report on the Regional Conference.

Dr. C. B. Wright (Minneapolis): I think that has been very well covered in the April Minnesota Medicine, and there is also a little editorial in the May issue by Dr. Meyerding that covers the situation. But briefly, the Regional Conference was started by Dr. Braasch. We had the officers of Minnesota, Wisconsin, North and South Dakota to start with, and this last year Iowa, Nebraska and Montana were invited. The Montana delegates, however, did not get here. We had a very interesting meeting, and after this conference we realized that the problems which interest us interest all our neighbors. As you know, North Dakota has had a bad fight this last winter. They have been trying to pass a basic science law. Wisconsin is starting very active work in its association and has a remarkably active public health program. That organization is very progressive. We also had some very interesting men, like Mr. Wiprud, who is Secretary of the Medical Society of Milwaukee County. We also had the Managing Director of the Iowa Association, Mr. Blank, who discussed a plan for taking care of the Health of the Iowa poor. A rift in the lute, however, was the report that societies cannot practice medicine for profit. Another thing was the question of insurance by societies, but that was worked out by every one taking out insurance, and they have signed agreements with the counties in which they take care of their local problems and the county pays them a small amount for it. If any one would like to ask about the conference, I would be very glad to answer them. (No questions.)

A motion was, made, seconded and carried, that the report be accepted.

President Sogge: We will next take up the report of the Committee on Public Policy and Legislation, of which Dr. Herman Johnson is Chairman. I would like to say this about Dr. Herman Johnson—I like to compare him with Lindbergh. Lindbergh was the first to fly alone across the Atlantic Ocean, and I feel that Dr. Johnson was the first to "fly" in medicine in Minnesota. I feel that he is too big for Minnesota and we ought to have him in Washington, D. C., to protect our profession against socialized medicine. (Applause.)

Dr. H. M. Johnson (Dawson): Mr. President and members of the House of Delegates: I want to tell you that the result of the activities of our Association and the result of its success is due not to one single man or individual, but to the coöperation of every one in the Association and its officers. And that has been better this year than it has been in the past. I am not in a mood to speak very much tonight. I am sorry to tell you that I lost a man who was my partner for over thirty years. A week ago Sunday night he was taken with a stroke and never spoke again. It was Dr. A. A. Stemsrud. Many times I felt that I was abusing my associates by going away and staying away like I did and they worked hard and were not given any credit, while I was given lots of credit. Many times I said I had better stay home, and Dr. Stemsrud would always say, "You had better go, Herman, and do what little you can to put this Association on its feet, and when you get it going it can take care of itself, but now is the time when every one must do his duty." When I look at his death, a queer sensation creeps over me.

This year we had really believed there would not be much trouble. Of course, we feared the election. Those who worked and looked ahead and saw the returns in the primary knew pretty well what governor we were going to have. Governor Olson, I think, has kept his word with us, but we had to do all we could to be sure to get a good House and a good Senate. You know about these different cult bills that come up, and you know they always have to be followed. If you don't have a representative there looking after them, they will get you. I have always said we had as much power and money and influence as our opponents and would stay with them as long as it was necessary. There were many activities by certain interests in the fall campaign, and I thought another bill would come up which would try to set a price on the work done on industrial cases by medical men and also by the hospitals.

The thing you are interested in, I think, is what we took part in, and that was against the confirmation of Duxbury on the Compensation Board. The Legislative Committee and the Council have for two years been trying, through the Governor and every other way, to get him to live up to the law. We didn't change the law, but we helped to fix it so he was not confirmed, and therefore the next one that will be in, will be willing to live up to the law. It wasn't Duxbury, but it was the principle. He was dictating where a patient must go. The law is that the patient may choose his own doctor. He wrote letters to the patients telling them that unless they went to the doctor he specified, hospital and doctor bills would not be paid. That meant we had a lot of work to do. There is no question that men in the country, and I think men in the city, know that that class of patients was taken from the hands of the best doctors and sent to others. The insurance companies claimed that they could get it done cheaper elsewhere. I am sure the medical men did not charge them any unreasonable rate. All kinds if propaganda was used, and there is no question but what they tried to antagonize us in one way or another. But they did not succeed, and I am sure the medical profession stands closer together today than it ever did. And instead of weakening our position, it is now stronger than ever. While we had to fight against some of our friends, we never need to fear, because as long as we are right we will come out ahead. We are stronger than ever because we are standing together better and better, and it is not due to any one man but due to the coöperation of all of us. The councilors stood one hundred per cent solid, and the President was there. My trouble came onto me when I should have laid off, but at a time like that you can't lay off.

We had a conference with the Governor and told him what kind of a man we wanted on the Industrial Commission—a good, square man, one who was an able lawyer with a judicial temperament and a judicial mind, and that we didn't want a man who was especially favorable to the laboring man or the medical man or the insurance man. And we felt also that we didn't want any Farmer-Labor man. I am not particularly against the Farmer-Labor party, but the law prescribes that the members of this Board shall be of different parties. The medical men tell me Mr. Gallagher of Waseca is as good a man as could be picked, and even the Republicans, those who fought for Duxbury so strongly and were very much interested in the insurance companies, told us he was all right, that it was a good appointment and they were well satisfied. Duxbury's policies were the beginning of state medicine. Maybe pretty soon half of the people will be protected by state insurance, and if the patients had to go where they were directed it would be a sad state of affairs.

We never, apparently, will get through with the quacks, but I think we have broken their backs more and more every year, because as the law is enforced more of them go to jail; but if we want to protect ourselves we absolutely have to fight every year.

Gentlemen, I want to thank you all and thank the ommittee. By standing together in the future like we have done in the past we can protect our interests, and our interest is our profession. I only wish our Naional Association was as active in looking after its nterests as we are in this state; this state has become known throughout the country as one of the most aggressive states

PRESIDENT SOGGE: It is wonderful for the Legislave Committee to be able to report one hundred per cent from a legislative session. I doubt if any other state ould do the same. I think the Legislative Committee ught to be congratulated and thanked for its efforts, nd with them Dr. Workman who spent a great deal f time in St. Paul looking after our affairs. Is there ny discussion on this report?

DR. A. H. PEDERSEN (St. Paul): In the first place, would like to know why a written report was not endered. It seems to me the chairman should render written report to the State Society. In the second lace, while it is shown that $5,000.00 was spent last ear, I understand there was $7,000.00 actually spent, nd I cannot understand why $7,000.00 was spent durg a non-legislative year. Another thing is, have we eally killed contract medicine? The University conacts to take care of students at a special rate. At entral High School in St. Paul we have free X-ray nd Mantoux tests. Isn't that state medicine? Have e closed all the portals to state medicine? I feel the societies which claim to be friendly to medicine are really antagonistic, because they have not said anything about paying for the examinations. I would like to hear why that money was spent.

DR. C. P. ROBBINS (Winona): I had the pleasure of being with the Legislative Committee last year. If any member would like to have information regarding how money was spent on legislative work, Dr. Johnson has had the accounts audited, and if any doctor is interested he can go to the Auditing Committee and get the information.

PRESIDENT SOGGE: Dr. Johnson, did you hear the question that was asked?

DR. JOHNSON: The Council has those matters in charge, and I think they have taken care of that part. Legislation goes on most all the time, and if you know anything about how things are done in the Legislature by other concerns you will know something about it. There was lots of work done. As to why it was not a written report, I think you have the report now. There was a report sent out, that is, a letter was sent out summarizing the activities during the session, but if you want another one, we will gladly furnish it.

PRESIDENT SOGGE: Where did you get the information that $7,000.00 was spent?

DR. PEDERSEN: From Dr. A. G. Schulze.

DR. A. G. SCHULZE (St. Paul): I think you are mistaken on that. $5,000.00 was the total.

PRESIDENT SOGGE: Are there any further questions?

DR. F. F. CALLAHAN (Pokegama): I would like to say something about the Mantoux tests in these cases of tuberculosis. I think if you are going to do anything to eradicate tuberculosis we must start at the root. If the practitioners can get the pupils in and do the work themselves, if they can convince the people that it is necessary, that will take care of the whole business. We have conducted some of these tests in the schools at Pine City. We were astounded at the results we found. We couldn't possibly get those people to come in as private cases. But when we found anything wrong with the patients, we referred them back to their private physicians for treatment. I know it is wholesale, but it is about the only way we can find the condition.

DR. WRIGHT: There seems to be some misunderstanding about this particular thing, and as I have been on the Legislative Committee for three sessions, I would like to say a word about it. I don't think the Mantoux tests in St. Paul schools have anything to do with this controversy. Possibly this gentleman does not know some of the things about this business that I do. When Dr. Johnson was asked to take the chairmanship of this committee, he specified two things only —One, that he should be given a budget, and that the Auditing Committee should audit it. I know the average professional man knows nothing at all about practical legislation. When I became a member of this committee I knew nothing about it, but I have learned considerable about this subject since. I know that you can't make an itemized report of any legislative activity and retain any influence whatever in the legislature. I doubt if any doctor here keeps an itemized report of his own personal expenditures. The way I feel about it is this: I don't know what you think about our efforts in the last six years. That is a matter for you to decide. But please decide that we are going to do some legislative work—and we are going to do it effectively—or we are not going to do it at all, because you are not going to do any effective work if you tie the hands of your committee member and make him give a report of every dollar he spends. If there is any intelligent criticism of what we have accomplished, let's hear it. Let's hear something constructive about the legislative program. I have been working with Dr. Johnson for six years and I never found him doing anything that was not on the square. When he returned from the hospital, men in the legislature and men who have fought him—put their arms around him and said, "Herman, we are glad to see you back, let's get together and work for the next campaign," that means something.

Dr. H. M. Workman (Tracy): I have been Chairman of the Finance Committee, and am Chairman of the Council. At Dr. Johnson's request I have attended all the meetings and stayed in St. Paul when I should have been taking care of my own business. But I know where every dollar has gone. I can't do more than that for you. I have done it honestly. If any man wants to question my honesty he can do it. The money was spent honestly, and we got results. If anybody thinks we didn't get results I would like to have him say so.

Dr. Robbins: We carried on the work at our own traveling and hotel expense and we never took a penny from the Legislative fund.

Dr. S. H. Boyer (Duluth): It is my opinion that anybody who asks such questions as have been asked here has never served on any Legislative body. For several years I have heard these little nagging and creeping complaints and questions as to what has been done with this five cents or this two cent stamp. They seem to be bothered about what we are going to do with a nickel or a dime. You can't get any place with that stuff. You have to spend your money if you want to live. What did you have before you spent any money in this state, Doctor? Did you have any influence?

Dr. Pedersen: No.

Dr. Boyer: Are you proud of what we have done, or not?

Dr. Pedersen: Absolutely.

Dr. Boyer: It leads me to suspect that some of you question the integrity of our Council and Dr. Herman Johnson. I assure you that every dollar has been spent with wisdom and intelligence. It is my opinion that if twice the money had been spent that what we got would have been cheap. Today the profession in Minnesota sweeps on with a grandeur that is not surpassed by any other state in the Union. It covers everything we can reach to protect the state against quackery and state medicine. We can't reach all these things at once, but we hope to succeed in getting to them. You have mixed our legislative work with University relations work. That is a matter that should be considered entirely separate and apart from what we are considering tonight.

Dr. A. B. Stewart (Owatonna): I am on no committee, but when I read in the report what Dr. Johnson's committee has accomplished, instead of criticizing it I move that we give a rising vote of confidence for the work they have done.

President Sogge: I would first like to know how many of the delegates here don't believe that they got value received for what was spent for the legislative work. When we get value received, what are we kicking about? I would like to hear from Dr. Slater on the Mantoux tests.

Dr. S. A. Slater (Worthington): This Mantoux test is something new. It has to be put on a firm foundation, and at the present time it is only in the experimental state. We know that the Mantoux test is a means of finding children who are infected with tuberculosis. We further know that the majority of children in whom we find the infection come from homes in which the infection exists. It is highly important that the Medical Association coöperate. When a child reacts to the test he is sent back to his family physician and he may look for the source of the infection. I think this is a very valuable means of finding the source of infection and eradicating tuberculosis. I believe the doctors are learning something about tuberculosis which will be of benefit to themselves as well as to their patients. And if the medical profession does not do what it should to eradicate tuberculosis, other forces will step in and do their part. With the medical profession conducting these tests I think the best results can be obtained without any danger of it becoming state medicine.

Dr. W. S. Broker (Battle Lake): During the past year we have conducted about 2,500 Mantoux tests on school children. It is almost impossible to get the children to go to a physician to get the test. In order to cover any ground at all it has to be done in what has been called a wholesale fashion. It has to be done in groups. I think for each child it is a very valuable experience. I think, far from being a detriment to the profession, it is going to be an advantage. The children are going to appreciate medical care and are going to have more work done and more attention paid to them than if it had not been done at all.

Secretary Meyerding: It happens that in Ramsey County there is an organization known as the Ramsey County Public Health Association. The Minnesota Public Health Association has little to say about Hennepin, Ramsey and St. Louis Counties. But in Ramsey County we are conducting what is known as the Mantoux test. It is done by Dr. Geer. I think the question Dr. Pedersen presented is a matter for the Ramsey County Medical Society to take up rather than one for this Association. We all know that state medicine is one of our problems. It is just around the corner in the United States. Canada now has it. We just have to wait until some state legislature will pass a law creating state medicine. I might explain to you something that might be considered along the same line. That is heart disease. For several years there has been a National association dealing with heart work. A few years ago a representative of that group came to me and asked if we would take it over. I did not care to consider it, but knew that if we did not, somebody else would; so we finally took it over. We have a heart committee in the State Medical Association, and the time is coming when the public will demand that we do something along the line like this tuberculin testing, social diseases, and so forth. If you don't recognize these movements and take a part and coöperate and assume leadership, somebody else will and you are going to be left in the background where you were all these years in the past. We have attempted to coöperate with the medical profession.

I think the most ideal example of what I am telling you about was done in Owatonna. A meeting was held there of the county medical society and the public health association. The family physician took care of those who were infected. Everybody who has a positive Mantoux reaction is referred to his physician for treatment, and I think it is a benefit to the medical profession as well as to the patient.

Dr. Wright: We have gone away from the question, our Legislative program. I think this is the vital thing that you are interested in, because you are spending your money on it. The thing I want is to hear you men discuss the legislative program. Possibly you don't know what was concerned in that Duxbury fight to start with. Two years ago they introduced a maximum fee bill. At that time three or four members of our committee tried to get in touch with Mr. Duxbury to discuss this bill with him. He said, "I have nothing to do with the bill, I am only on the Industrial Commission." We went before the Committee and were able to convince them that the bill would hurt the patient. In other words, if you put the maximum fee too low it will deprive them of all the care they need, and if you put the maximum fee too high it makes the insurance too high. So Senator MacKenzie, the sponsor of the bill, withdrew it. This year they tried to introduce a bill which would give the Industrial Commission the right to set the maximum fee; and when we found out the facts of the case, Mr. Duxbury admitted to Mr. Brist that he drew the bill himself. I will admit that I would not have had the nerve to go against Mr. Duxbury, because I knew what was behind him. I want to tell you that Mr. Fesler told me that if it were not for the demonstration of the power of the Medical Association in preventing the endorsement or confirmation of Mr. Duxbury, it would eventually have resulted in the loss of thousands and possibly millions of dollars to the hospitals and profession of this state. That is one of the things this committee has accomplished.

I would like to have some constructive and intelligent criticism about what has been done by this committee. But I think the mere discussion of how people spent a few dollars here or there is entirely outside the question.

Dr. F. H. Magney (Duluth): I am not on any of the committees, and personally I don't care to know where any of the $5,000.00 has gone. I appreciate the efforts of Dr. Johnson and this committee, but I have even failed to write to my legislators in compliance with the request of Dr. Johnson.

Dr. B. S. Adams (Hibbing): I have known Herman Johnson ever since I went to school, and I know he is not only efficient but honest. I want to make a motion that we give Dr. Johnson a rising vote of thanks for the splendid work he has done.

A rising vote of thanks was then extended to Dr. Johnson.

Dr. Johnson: I wish to thank you gentlemen. I beg no favors. I respect and admire the interest and enthusiasm you have shown, and the gentleman who has so much to complain about I want to tell him that if he knew more about what he talked he would not talk that way. I wish he was doing it himself.

President Sogge: The next report is the report of the Committee on Public Health Education.

REPORT OF THE PUBLIC HEALTH EDUCATION COMMITTEE

The Committee has continued its past policies of reaching the profession and placing before them problems that exist in their relations with the public. At the same time a consistent contact has been kept up with the public itself. The Chairman of this Committee is also a member of the Committee on State Health Relations and the Public Health Nursing Committee. These memberships are for the purpose of correlating the activities of the committees mentioned.

EXPENDITURES

We are presenting a financial statement that shows the various expenditures under definite heads. It will be noted that there are several expenditures that are not primarily the function of this Committee, but were made upon the request of the Council. Our total Annual Budget Expenditure is a financial statement of the activities of our Committee, plus other financial outlays voted by the Council.

FINANCIAL REPORT

1930 Analysis of the Public Health Education Expenditures

Mr. Brist	$ 479.09
News Service	1,300.90
Meetings—Public Health, Med. Economics, County Society, Officers Conferences, Public Health Nurses, etc.	355.62
Sundries, Petty Cash, Telephone, Telegrams	19.58
Stenographer	1,310.00
Misc. Postage and Printed Matter	78.81
Speakers Library Material	36.95
Radio	528.36
Speakers—State Annual Meeting at Duluth, Health Tours, etc.	767.68
Legislature—Hygeia and Everybody's Health	314.50
A. M. A. Delegates Expense	168.80
Diphtheria Prevention Campaign	538.77
Total	$5,899.06

F. MANLEY BRIST:

Mr. Brist gave talks upon the activities of the Minnesota State Board of Medical Examiners and the operation of the new Medical Practice Act and Basic Science Laws. These talks were given to both medical and lay groups for the purpose of emphasizing the importance of the enforcement of medical laws. The following groups were addressed by Mr. Brist during the past year:

Nicollet—LeSueur County Society.
Secretaries Conference.
Mankato, Blue Earth County.
Stillwater, Lions Club.
Hennepin County Auxiliary.
Colloquium Course at Winona.
Wadena.
Freeborn County.
Mower County.
Iowa State Medical Association.
St. Cloud, Stearns-Benton County.
Blue Earth Valley.
Willmar-Kandiyohi-Swift County.
Wabasha County.
Olivia.
Houston-Fillmore County Society.

NEWS SERVICE

The weekly newspaper service has continued to grow and improve. Thanks in a large measure to the facilities offered by the Minnesota Public Health Association, who have made it possible for us to engage expert service at a minimum expenditure. The number of papers are gradually increasing, until we have now 300. A sub-committee is appointed to censor the newspaper stories.

MEETINGS

Public Health—Medical Economics—County Society—Officers' Conferences—Public Health Nurses

Traveling expenses of various members of the Association were paid for attending meetings at which they spoke. These meetings consisted of Public Health meetings, Medical Economic meetings of the various county societies, and all Public Health Nurse groups.

STENOGRAPHER

The Committee has always paid the salary from its budget of one of the employees at the State Office. While this employee is only giving part time to the Committee, yet the entire time of this person is being charged. Commencing with 1931 a pro-rata arrangement has been made whereby the salary will be distributed in a different manner.

SPEAKER'S LIBRARY MATERIAL

Suitable material was purchased and distributed to the members of the Committee and for filing in our lay speaker's Library.

RADIO

This series of talks are undoubtedly the most popular health talks in this section of the radio world. The Committee believes in Dr. O'Brien's talks from both the scientific and organization standpoint and that they are well worth the cost.

SPEAKERS—ANNUAL MEETING, HEALTH TOURS, ETC.

In this are included the fees necessary to be paid to lay speakers at various health meetings which we participated in and also the honorarium and expenses for two of the speakers at the last annual meeting in Duluth amounting to $206.23.

Rev. Wm. C. Sainsbury of Fargo assisted at the following places:

Waseca County Public Health.
St. Olaf College.
Kandiyohi County P. T. A.
Lyon Lincoln Medical Society.
Women's Federated Clubs, Olivia.
Comstock Federated Clubs.
Glenwood Kiwanis, P. T. A. and High School.
Detroit Lakes P. T. A., High School.
Crookston Seal Sale Institute.
Luverne Lecture at High School.
Alexandria P. T. A. meeting.

LEGISLATURE—HYGEIA AND EVERYBODY'S HEALTH

We have again the past year sent Hygeia and Everybody's Health magazines to the Legislature of Minnesota.

A. M. A. DELEGATES EXPENSE

The Council ordered that the expenses of the delegates to the American Medical Association be drawn from our budget.

DIPHTHERIA PREVENTION CAMPAIGN

As our part of the Diphtheria campaign, which the Minnesota State Board of Health, Minnesota Public Health Association and the Committee on Hospitals and Medical Education are sponsoring, we expended a considerable amount for posters that were distributed to the schools and other public places.

CONCLUSION

While we aim to instruct the public as regards scientific medicine and have them realize that on the whole their best interest lies in the hands of the members of the State Association, a large part of our work is within the profession and might be considered organization work.

George Earl, *Chairman.*

Dr. Manley: The Reference Committee commends the very valuable work of the Public Health Education Committee, and recommends that the activities of this committee be continued. We recommend the adoption of this report.

Dr. George Earl (St. Paul):

In the four years in which we have been allowed a budget, we expended in 1927, $2,033.77 out of an allowance of $5,000.00; in 1928 we expended $3,944.26 out of an allowance of $7,000.00; in 1929 we expended $4,304.15 out of an allowance of $7,000.00, and in 1930 we expended $5,899.06 out of an allowance of $6,000.00; or during the four years of our existence we have expended only a part of what we were authorized.

Our reasons for this economy were: First, that the work was new and we desired to approach the subject cautiously. In the second place, by coöperating with the Minnesota Public Health Association, we were able to undertake the program with greater economy than probably any other State Association. Third, the work undertaken has been only in direct response to requests from the officers, council, county societies and members of the Association.

Such expenses as that of Mr. Brist in connection with the explanation of the operation and enforcement of the New Basic Science Law and the New Medical Practice Act to the Medical Profession; the Radio Committee's expense; the coöperation with the Legislative Committee by sending Hygeia and Everybody's Health to all the members of the Legislature; the A. M. A. delegates' expense; the foreign speakers to the Annual State Meeting in Duluth; and the stenographic and office expenditures in connection with a great many of the other Committees and activities have been charged to our budget.

A review of the present State Organization would show that we deal with questions of public health contact through the following Committees:

The Committee on State Health Relations.
The Radio Committee.
The Committee on Contract Practice.
The Committee on Medico-Legal Affairs.
The Committee on University Relations.
The Heart Committee.
The Committee on Schools for Laboratory Technicians.
The Committee on Public Health Education.
The Committee on Hospitals and Medical Education.

The Legislative and other Committees also have dealings with the public.

Medical leadership should be encouraged in the County as regards Public Health Association, Red Cross, Editorial and Legislature coöperation and other public contacts. The major portion of our committee's time and if you will look at the budget of the four years and especially the first years, the major portion of our committee's budget has been expended on encouraging such local leadership.

Anyone that has had any experience in this matter will realize the difficulty of securing local medical leadership. A few places have it and have put on excellent programs; this because of their own native ability. Where we find that such native ability does not exist it is just as difficult to promote it as it is in any other phase of life. From promoting county and local medical leadership has come the demand for a demonstration by the State Society in the form of radio talks, or newspaper service and of help on Public Health Meetings as the opening wedge of contact toward further establishing the relations that your Committee suggests. In the State of Minnesota there are millions of dollars spent annually effecting the question of Public Health Education. We have Corey, McFadden, and other newspaper service; Christian Science, patent medicine propaganda, League of Medical Freedom and Anti-Vivisection Leagues; then all of the cults; further, lay organizations for tuberculosis, cancer and heart; and all of the forces of state medicine and state institutions, privately endowed institutions and all the private practice activities of our association members.

The problem for the Minnesota State Medical Association to determine is, first, shall we as an organization take any part in directing public health activities and in influencing public health opinion by any other method than that of our scientific achievements. Undoubtedly the scientific practice is the contribution that should take the vast majority of our energy, but if some public health education work is not undertaken will there be other forces without our help sufficient to counteract the aggressive attacks of those whom we believe to be in error on public health problems.

Our Committee has always felt that the best possible public contact depends on the scientific ability, public health attitude and willingness to undertake its individual share of advancing the cause of health by each one of the two thousand members of the Association in his daily medical practice and contacts of life. Of necessity some type of organization is advisable to help in some small measure with planning and demonstration.

Dr. E. Klaveness (St. Paul): Would it not be possible next year to save the expense of $479.00 paid to Mr. Brist?

Dr. Earl: I don't know if I am as well qualified to answer that question as the Council is. We are paying $2.00 per year to the Board in whose employ Mr. Brist is, and they are a Board appointed by the State of Minnesota through the Governor. This Board would be subject to criticism if Mr. Brist did any work for us on time for which he is paid by them. Fortunately, Mr. Brist is a wonderful speaker before luncheon clubs, etc. We are able to secure this rather brilliant, able attorney for $400.00 a year, and in my mind we should thank the State Board of Medical Examiners for letting us share Mr. Brist at this nominal expense. Does that answer your question?

Dr. E. Klaveness: Yes.

Upon motion regularly made and seconded the report was accepted.

President Sogge: The next report is that of the Editing and Publishing Committee.

REPORT OF EDITING AND PUBLISHING COMMITTEE

It again becomes my privilege to submit a report on the publication of your journal, Minnesota Medicine, for the year. The period covered in the report is the calendar year of 1930.

The twelve numbers of the journal included in Volume XIII contained a total of 1290 pages, or an average of 107.5 pages for each issue, the largest number of pages that has ever been printed in any one year. Of this total, 938 pages were devoted to reading matter and 352 to the advertising section, making an average of 78.2 pages of reading matter and 29.3 pages in the advertising section for each issue. The total number of illustrations was 323. This is also the largest number of illustrations ever printed in the journal in one year. Had all this editorial material been supplied to the readers in book form, it would have been a volume of 1,200 pages with more than 300 illustrations.

The total number of articles published during the year was 131, 16 of which were case reports. Other case reports and discussions of interest to the medical profession were published in the Proceedings of the Minnesota Academy of Medicine and the Minneapolis Surgical Society.

Several changes have been made during the year in the personnel of the staff contributing to the progress section. This section, under the direction of Dr. Lewis M. Daniel of Minneapolis, has continued to be a definite service to readers of the journal. A section entitled Tuberculosis Abstracts has been added under the heading of Medicine. These Abstracts are direct reprints of the monthly bulletin of that name published by the National Tuberculosis Association. Another recent addition to the journal is the publication of the Proceedings of the Minneapolis Clinical Club.

The circulation of MINNESOTA MEDICINE for the year 1930 is reported as follows:

Members (paid)	2,053
Members (delinquent)	148
Non-member subscriptions	105
Miscellaneous copies distributed single copy sales, exchanges, complimentary, advertising, etc.	369
Surplus on file	125
Total	2,800

The following report of receipts and disbursements from the period January 1, 1930, through December 31, 1930, was submitted to the secretary of the Association in January, 1931:

CASH RECEIPTS

Display advertising	$ 8,780.17	
Illustrations	98.82	
Member subscriptions	4,106.00	
Non-member subscriptions	310.48	
Advertising dividend	462.04	
Total Cash Receipts		$13,757.51

CASH DISBURSEMENTS

Journal expense		$14,023.37	
Discounts allowed:			
Advertising	$1,205.01		
Subscriptions	22.25	1,227.26	
Total Cash Disbursements			$15,250.63
Cash deficit for the period			1,493.12

It is much to our regret that the publication shows a deficit for the period. This is the first year since MINNESOTA MEDICINE was established more than thirteen years ago, that a deficit has been shown. This was due to two causes, the most important perhaps being the general business depression, general throughout the country, which had a serious effect upon our advertising volume. The other cause was the increased cost of printing due to the fact that nearly 100 pages more were printed than during any previous year, and that a larger number of copies were printed and distributed than for any previous similar period. The editors also used a larger number of illustrations in the journal than for any other year, and this cost alone amounted to in the neighborhood of $500 more than for any previous year.

Effective January 1 the advertising rates in the journal were advanced ten per cent. This advance applies to practically all the advertising contracts now in course of execution and to any new business which may be signed during the year. We are hopeful that this small increase in the advertising rates will serve to enlarge our volume, in conjunction with a greater volume of new business which we hope to obtain with improved conditions, to make a much more favorable showing for 1931 than was made for the previous year. Already, for the first quarter of 1931, we show an increase of approximately 15 per cent in volume of display advertising over the corresponding period for last year.

If the moderate improvement which has been shown in business conditions continues for the year, we believe that the amount of display advertising executed in the journal will be more than sufficient to prevent a deficit for this year. It should be borne in mind, however, that the sale of advertising is largely contingent upon a maintenance of the improvement in business conditions. The experience of MINNESOTA MEDICINE during 1930 is not unlike that of practically every other publication of a similar character in the whole country last year. As a matter of fact, daily newspapers and large magazines similar to the Saturday Evening Post and the Ladies' Home Journal and others of that type, showed an enormous loss in lineage. It is a condition over which we, of course, have no control, but you may rest assured that we are putting forth every possible effort to maintain and increase our volume for this year.

Respectfully submitted,
J. M. ARMSTRONG, *Secretary.*

DR. MANLEY: The Reference Committee moves the adoption of this report.

Upon motion regularly made and seconded the report was adopted.

PRESIDENT SOGGE: The report of the Radio Committee.

REPORT OF THE RADIO COMMITTEE

One hundred and sixty-four radio programs were broadcast under the direction of the Radio Committee from April 3, 1928, to May 1, 1931. With the exception of two programs from Station KSTP, all have been sent from Station WCCO. A complete list of the programs up to June 1, 1930 (117), may be found in MINNESOTA MEDICINE, Proceedings of Sixty-second Annual Meeting, xiii, 750:751, October 1930. From June 1, 1930, to May 1, 1931, forty-seven additional programs have been broadcast:

Subjects: (1) Cardiac Neurosis; (2) Minnesota Department of Health; (3) Pyelitis in Young Girls; (4) Pituitary Gland; (5) Vacation Time; (6) Growth in Childhood; (7) Cause of Hernia; (8) Facial Neuralgia; (9) Common Foot Disorders; (10) Poison Ivy; (11) Knock Knees and Bow Legs; (12) Cause of Fever; (13) Cancer of the Stomach; (14) Bowel Obstruction; (15) Trench Mouth; (16) Cause of Flatulence; (17) Acne; (18) Finish the Job; (19) Cancer of the Rectum; (20) Father of Medicine; (21) Food Fads; (22) Finger Infections; (23) Poliomyelitis; (24) Treatment of Cataract; (25) Carcinoma of the Lip and Mouth; (26) Psoriasis; (27) Gallstones; (28) Mental Hygiene; (29) Christmas Seal; (30) Cancer of the Skin; (31) Carbon Monoxide Poisoning; (32) Peanut Bronchitis; (33) Cause of the Common Cold; (34) Cancer of the Breast; (35) Humidity in the Home; (36) Control of Diphtheria; (37) Treatment of Constipation; (38) Cancer of the Uterus; (39) The Rheumatic Child; (40) Treatment of Insomnia; (41) Cause of Meningitis; (42) Cancer of the Bladder; (43) Health Education; (Third Anniversary) (44) High Blood Pressure; (45) Health in the Home; (46) Nervous Exhaustion; (47) Cancer of the Kidney.

All have been sent from Station WCCO, Wednesday mornings at 11:15 a. m. The change from the earlier time (10:15 a. m.) was made during the winter months because of conflicting stock market reports. Station WCCO still continues to voluntarily ask our aid in censorship and has been most coöperative in this and other regards. Good publicity has been received during the past year from the papers and the station. In addition, special notices of the programs are being sent to various journals and publications which reach the medical nursing professions.

Abstracts appear every month under the title "Health from the Air," in Everybody's Health. The audience is apparently growing, and mail is still received from Minnesota, North and South Dakota, Iowa, Wisconsin, and Northern Michigan. Mail from interested listeners is becoming heavier as time goes on. In addition, the Committee has learned, directly and indirectly (from personal contacts), of the large number of people who are regular listeners and are pleased with the service. The attitude from the beginning has been to offer a message which was not too complicated for the ordinary layman to understand, and which contained something of practical interest for him. Interest in health grows with understanding. The air is polluted more than ever with quackery. The attitude of Station WCCO in this respect is commendable. In addition to furnishing us with the time and facilities for the program without charge, they have voluntarily excluded from their programs, anything which was not in accord with the type of service the medical association was attempting to render through health education. There is much work to be done along these lines with the other stations not only in Minnesota but through the country (chain broadcasts). The value of health education through sustained effort and constant repetition of certain ideas (although only a very small number of talks have been repeated) is very evident. We are now entering our fourth year of broadcasting (3rd Anniversary, April 3, 1931) and believe that the future has even greater possibilities in store. The Committee urges that the programs be continued, and expresses its appreciation for the many favorable comments received on the service rendered.

We are making a survey of the broadcasting stations in Minnesota as to the type of advertising that is going over the air—whether it is ethical or not, etc. We regret that our data is not complete for this report.

L. R. Critchfield, *Chairman.*

Dr. Manley: The Reference Committee believes that the work of this committee and that of Dr. O'Brien is of the utmost value. It particularly commends the committee for attempting the survey of stations broadcasting in Minnesota as to the type of medical advertising on the air—whether it is ethical or not. We move the adoption of this report.

The motion to accept the report was seconded and carried.

President Sogge: The report of the Historical Committee.

REPORT OF THE HISTORICAL COMMITTEE

At the banquet of the state meeting of the Minnesota State Medical Association in June, 1927, Dr. C. H. Mayo called attention to the advisability of preparing a medical history while we have the older members still with us. The report of the Council meeting of October 12, 1927, contains a motion by Dr. Wattam that a historical committee be appointed by Dr. Wright to gather data concerning the history of the Minnesota State Medical Association. A committee of seven was subsequently appointed and has since been at work gathering material for a history and preparing it for publication.

Two formal reports have since been made to the Council and House of Delegates and one to the society, outlining the headings under which we have planned to write the history. In 1929, we stated at some length our troubles in securing necessary facts, in arranging them in readable form and the long labor of corroborating data from sources often untrustworthy.

Material for our history has come in slowly. Though a number of the chapters are now practically ready for printing, there are others on which we have made no progress whatever and it now seems to us that we shall be obliged to find someone else to write certain chapters. Under these circumstances, parts of our history will be much delayed.

Under similar conditions, some of the states have brought out their history in volumes appearing at such times as the accumulation of material has permitted. Your committee recommends similar action in respect to the Minnesota history and we believe we now have on hand material sufficient for Volume No. 1. Of course, the contents should be such that each chapter will bear some natural relation, as chronological, to other chapters, though we will also have to be governed somewhat by the actual material available.

We believe we could have ready for the first volume something concerning the real pioneers, such as certain medical men who were associated with the early fur companies; Dr. Williamson, the medical missionary; Major Purcell, who came here as the medical officer to the troops to build Fort Snelling, and John Marsh, who was his pupil. The history of the Minnesota State Medical Association and of the Ramsey and of the Hennepin County Medical Societies is already typed. We also have a manuscript of a few pages, prepared by a Dr. Fairchild, who was here in very early days and who wrote a most interesting article concerning pioneer conditions. Dr. Clark, of the Soldiers Home, had an article years ago on the physicians of the St. Croix Valley and we believe we could get ready something concerning the Winona group which was a very distinguished lot of men and perhaps the Red Wing men and the Duluth group and something concerning the early physicians of the Minnesota River Valley.

This would give a group of articles, all dealing with very early times, and would be sufficient to make one volume of about the size that we agreed upon as satisfactory when we adopted in a tentative way such a volume as the Michigan State Society has put out, a copy of which is on exhibition. Though we have entered on no formal arrangement with anyone, we have had the advice of Mr. Bruce, publisher of MINNESOTA MEDICINE, and we expect to prepare a volume about seven by ten inches and containing about nine hundred pages. The history of the Michigan State Medical Society seems to us very desirable in size, form and general appearance.

Michigan has 3,476 members in its State Society and they published 1,100 copies of a two volume history or 2,200 books. Minnesota has 2,227 members in its State Association and Mr. Bruce suggested that we publish 1,000 copies, bind 500 copies and use the remainder when needed. If we prepare one volume of 900 pages, it would cost about $2,900 to $3,200 with index and plates. If we prepare two volumes, and we think this will be necessary, of about 900 pages each, it will cost us something like $5,000 to $6,000 for the two volumes. This would include the index and a reasonable number of plates.

The eventual cost to the State Association is a matter of much importance. Illinois, with a State Society membership of 7,361, at $5.00 per volume, sold 500 copies of the first volume, or a percentage of practically seven. Michigan, with a membership of 3,476, at $5.00 per volume, also sold 500 copies, or a percentage of fourteen. Nebraska, with an Association membership of 1,207, at $15.00 per copy, sold to 25 per cent of the members. North Dakota with a State Association membership of 391, at $3.50 per volume, sold copies to 55 per cent of its members. These figures show a very wide range in the percentage of copies sold to members in the different states.

We advise that our history be published in two volumes of 1000 copies each, each volume containing 900 pages, and that Volume No. 1 be put into type as soon as is reasonably possible. We also advise that 500 copies of Volume No. 1 be bound as soon as printed and be sold at $5.00 per copy or volume. We further advise that there be a preliminary canvass of the entire Association membership so that we may have some idea in advance of publication of the number of books needed. Naturally, the result of this canvass may make some change in our plans.

Up to date, practically all work on the history, including even the typing has been done gratuitously by individual members of the Association, but we feel that in the course of the ensuing year, the time will arrive when certain expenses must be borne by the Association. Someone should conduct a preliminary canvass of the medical men of the state. Secretarial assistance will be necessary in the proof-reading and the preparation of the index besides certain typing which should not be left to the Committee's personal secretaries. We have not meant to imply that there has been any shortage in money supplied us in the past. On the contrary, we have at all times been alloted a much larger sum than we have ever used. It has merely been a case that in the many more or less minor situations that have arisen, it was not convenient to ask for outside assistance.

We have no definite idea as to just what these special situations will call for, but we estimate an index at something like $175.00 and the bill for rewriting copy preliminary to publication will be at least $250.00. As far as we can judge, $750.00 is a fair sum to add for these special situations and this is in addition to the cost of final publication as referred to previously.

If the Association authorizes the publication of Volume 1 at this time, we will make an attempt to have it ready for the 1932 meeting, but previous experience has made us cautious in giving definite promises.

ARTHUR S. HAMILTON, *Chairman.*

DR. MANLEY: The Reference Committee realizes the value of this important work and recommends that the question of the time of publication, expenditure of money, and so forth, be referred the Council for action.

DR. A. S. HAMILTON (Minneapolis): Mr. Chairman and Members of the House of Delegates: We have already presented a formal report on this subject and explained our views as well as we could. Anyone who has looked over the report will observe a very great difference in the sale of the copies. In North Dakota they sold 55 per cent of the members of the society, and in Illinois about 7 per cent. There should be a careful investigation over the state to see how many are willing to purchase a publication of this sort. If anyone has any questions about the matter, I would be glad to answer them if I can.

DR. ROBBINS: I move that the report be adopted.

The motion was regularly seconded, put to a vote and carried.

PRESIDENT SOGGE: Next is the report of the Necrologist.

NECROLOGIST'S REPORT

May, 1930, May, 1931

MEMBERS OF MINNESOTA STATE MEDICAL ASSOCIATION

ANDREW E. ANDERSON, Minneapolis. Born 1859. Colorado University. Died, Dec. 11, 1930. Aged 71.

Charles Riggs Ball, St. Paul. Born 1867. University of Minnesota, 1894. Died, Dec. 19, 1930. Aged 63.

Bernhard Stanton Bohling, Sandstone, Minn. Born 1887. Northwestern University, 1912. Died, Dec. 20, 1930. Aged 43.

Dwight F. Brooks, St. Paul. Born 1849. Long Island College Hospital, 1876. Died, January 21, 1930. Aged 81.

Theodore Bratrud, Warren. Born 1873. University of Minnesota, 1898. Died, Dec. 6, 1930. Aged 57.

Alfred Erwin Comstock, St. Paul. Born 1872. Hahnemann Medical College of Chicago, 1899. Died, July 24, 1930. Aged 58.

Charles Frederick Disen, Minneapolis. Born 1861. Rush Medical College, Chicago, 1886. Died, August 6, 1930. Aged 69.

Frederic A. Dunsmoor, Minneapolis. Born 1853. Bellevue University. Died, Dec. 16, 1930. Aged 77.

Brainerd Pease Flinn, Redwood Falls. Born 1892. Rush Medical College, Chicago, 1918. Died, March 3, 1931. Aged 39.

Luther Lewellyn Gibbon, Lowry. Born 1876. University of Minnesota, 1897. Died, May 24, 1930. Aged 54.

Alfred Benjamin Hart, Jr., Owatonna. Born 1902. St. Louis University School of Medicine, 1925. Died, Jan. 4, 1931. Aged 29.

Walter B. Holmes, Ada. Born 1866. University of Minnesota, 1894. Died, Oct. 27, 1930. Aged 64.

August Elof Johnson, Minneapolis. Born 1869. Hamline University, Minneapolis, 1906. Died, Oct. 19, 1930. Aged 61.

William A. Jones, Minneapolis. Born 1859. University of the City of New York, 1881. Died, Jan. 15, 1931. Aged 71.

John A. Lyng, Minneapolis. Born 1864. University of Minnesota, 1890. Died, Sept. 27, 1930. Aged 66.

O. S. Neseth, Kenyon. Born 1886. University of Illinois, 1917. Died, April 23, 1931. Aged 45.

J. P. O'Connor, St. Paul. Born 1869. Minneapolis Physician's and Surgeon's College, 1900. Died, March 2, 1931. Aged 62.

William Phelps Robertson, Litchfield. Born 1887. Detroit College of Medicine and Surgery, 1912. Died, Oct. 21, 1930. Aged 43.

Andrew Soderlind, Minneapolis. Born 1862. University of Minnesota College of Medicine and Surgery, 1890. Died, March 22, 1931. Aged 69.

A. A. Stemsrud, Dawson. Born 1872. University of Minnesota, 1901. Died, April 27, 1931. Aged 59.

Fred A. Swartwood, Waseca. Born 1860. Medical College, Ann Arbor, Michigan, 1886. Died, Nov. 12, 1930. Aged 70.

PHYSICIANS NOT MEMBERS OF STATE ASSOCIATION AT THE TIME OF DEATH

William A. Chamberlin, Waseca. Born 1856. Rush Medical College, Chicago, 1882. Died, Sept. 27, 1930. Aged 74.

Alexander Augustus Cirkler, Minneapolis. Born 1865. University of Berlin, 1893. Died, Dec. 30, 1930. Aged 65.

John Charles Drexler, Brandon, Minn. Born 1851. Died, Jan. 22, 1931. Aged 79.

William Henry Hallowell, Minneapolis. Born 1853. University of Pennsylvania School of Medicine, 1880. Died, Dec. 14, 1930. Aged 77.

Olaf E. Krogstad, Minneapolis. Born 1862. University of Vermont College of Medicine, Burlington, 1893. Died, May 14, 1930. Aged 68.

George Allen Love, Preston. Born 1851. Bennett College of Eclectic Medicine and Surgery, Chicago, 1874. Died, Dec. 4, 1930. Aged 79.

Charles M. Long, Osakis. Born 1849. Rush Medical College, Chicago, 1878. Died, Aug. 3, 1930. Aged 81.

Jacob Wright Magelssen, Rushford. Born 1844. Rush Medical College, Chicago, 1866. Died, Jan. 9, 1931. Aged 87.

Hertz Nathaniel Meleck, Minneapolis. Born 1880. Medical Department, Hamline University, 1903. Died, March 27, 1931. Aged 51.

S. P. Meredith, Mankato. Born 1852. Hahnemann Medical College and Hospital, Chicago, 1882. Died, Sept. 30, 1930. Aged 78.

Walter Arthur Monnich, Minneapolis. Born 1884. Baltimore Medical College, 1910. Died, Aug. 28, 1930. Aged 46.

Louis Leypoldt Moench, Waterville. Born 1876. Eclectic Medical Institute, 1903. Died, June 2, 1930. Aged 54.

Charles I. Remington, Walnut Grove. Born 1860. College of Physicians and Surgeons, Keokuk, Iowa, 1879. Died, July 3, 1930. Aged 70.

John Frederick Russ, Blue Earth. Born 1866. University of Iowa, 1893. Died, Aug. 13, 1930. Aged 64.

M. L. Stiffler, St. Paul. Born 1887. University of Colorado, 1913. Died, Sept. 7, 1930. Aged 43.

Louis Leonard Ten Broeck, Minneapolis. Born 1876. Rush Medical College, Chicago, 1907. Aged 54.

Frank L. Wilcox, Walker, Minn. Born 1877. Rush Medical College, Chicago, 1900. Died, Aug. 29, 1930. Aged 53.

Ulysses G. Williams, Minneapolis. Born 1865. University of Minnesota, College of Medicine and Surgery, 1889. Died, Jan. 13, 1931. Aged 66.

Oesten K. Winberg, Lake Park. Born 1864. University of Minnesota, College of Medicine and Surgery, 1892. Died, Dec. 27, 1930. Aged 66.

Christopher J. Woolway, Duluth, Minn. Born 1854. McGill University Faculty of Medicine, Montreal, 1875. Died, Oct. 28, 1930. Aged 76.

Dr. Olga S. Hansen (Minneapolis): It seems but right and fitting that in the midst of this manifestation of the things that are of immediate interest to us we stop for a few moments to pay tribute to the members who have died during the past year. The names of twenty-one members have come to the attention of the committee. You know the names and you will recognize those of personal friends and others who have done very much for the cause of medicine in this state. "For them life's duration was measured by deeds done, and not by years lived. Nothing is here for tears, nothing to wail or knock the breast; no weakness, no contempt, dispraise or blame, nothing but well and fair and what may quiet us in a death so noble."—(Milton.)

President Sogge: As a mark of respect for those who have passed on, let us stand a moment in silence.

The audience rose and stood in silence.

The Report of the Committee on Hospitals and Medical Education.

REPORT OF THE COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

The new committee chairman is presenting herewith his first report of the Committee on Hospitals and Medical Education. The wholehearted coöperation of Mr. Richard Price of the Extension Division of the University of Minnesota has made possible the following list of lectures during the past year. In addition, there is appended a report from Dr. W. A. O'Brien which itemizes the work of the Consultation Bureau.

In the near future a new booklet containing titles and a short abstract of each lecture will be sent to the secretaries and correspondents of every county society.

We hope to enlarge the scope of this committee during the coming year. We solicit the constructive criticism of every member of the state society, hoping that this will make it possible for us to improve our lectures so that they will become more popular.

REPORT OF EXTENSION COURSES

June 1, 1930, to May 31, 1931

Below is a summary of the medical short courses conducted by the General Extension Division since May, 1930:

HAWLEY

July 12—Dr. Owen H. Wangensteen—The Diagnosis and Treatment of Acute Intestinal Obstruction.

Cost—$33.00

FERGUS FALLS

Oct. 1—Dr. G. B. Eusterman, Rochester—Gastro-Intestinal Disease.

Oct. 15—Dr. Moses Barron, Minneapolis—Hypertension.

Nov. 12—Dr. G. B. Doyle, Rochester—Neurological Diagnostic Methods.

Nov. 19—Dr. H. G. Irvine, Minneapolis—Skin and Syphilis.

Nov. 26—Dr. Wallace Cole, St. Paul—Orthopedic Surgery.

Dec. 3—Dr. J. M. Hayes, Minneapolis—Treatment of Varicose Veins and Ulcers.

Cost—$75.00. Average attendance—18.

HIBBING

Sept. 4—Dr. Emil Geist, Minneapolis—Personal Experiences with the Bohler Treatment of Fractures.

Sept. 18—Dr. F. W. Spicer, Duluth—Heart Diseases.

Sept. 25—Dr. W. A. Coventry, Duluth—Abnormal Menstruation, Especially Painful Menstruation, and Abortion.

Oct. 2—Dr. W. F. Braasch, Rochester—Hematuria.

Oct. 16—Dr. E. L. Tuohy, Duluth—Non-Tuberculous Chronic Lung Conditions.

Oct. 23—Dr. A. S. Hamilton, Minneapolis—Examination of Cases for Testifying in Court, Especially Compensation Cases.

Oct. 30—Dr. S. H. Boyer, Duluth—Status of State Medicine.

Nov. 6—Dr. Leo Rigler, Minneapolis—Diagnosis of Bone Diseases (Not Tumors), Especially Adolescent.

Cost—$185.00. Average attendance—25.

LITTLE FALLS

Oct. 1—Dr. W. E. Patterson, Minneapolis—Diseases of the Nose, Throat and Accessory Sinuses.

Oct. 8.—Dr. Moses Barron, Minneapolis—Diabetes.

Oct. 15—Dr. E. M. Hammes, St. Paul—Problems in Diagnosis between Functional and Organic Nervous Diseases.

Oct. 29—Dr. E. S. Platou, Minneapolis—Contagious Disease Symposium.

Nov. 5—Dr. H. E. Michelson, Minneapolis—Dermatological Clinic (Lantern).

Nov. 12—Dr. Gilbert J. Thomas, Minneapolis—Prostatic Disease.

Nov. 19—Dr. C. W. Waldron, Minneapolis—Oral Surgery.

Dec. 3—Dr. H. M. N. Wynne, Minneapolis—Gynecology.

Cost—$120.00.

MARSHALL

Sept. 30—Dr. Rood Taylor, Minneapolis—Disease and Disturbance of Digestion in Infancy and Childhood.

Oct. 14—Dr. P. W. Giessler, Minneapolis—General Orthopedics.

Oct. 28.—Dr. J. S. Lundy, Rochester—Local, Spinal, and Sacral Anesthesia, etc.

Nov. 4—Dr. W. H. Goeckerman, Rochester—The Relationship of Dermatosis to General Medical Problems.

Nov. 18—Dr. H. C. Habein, Rochester—General Medicine.

Cost—$115.00. Average attendance—30.

OLIVIA

Sept. 8—Dr. H. B. Zimmerman, St. Paul—Acute Abdomen.

Sept. 22—Dr. L. A. Brunsting, Rochester—Itching Skin.

Sept. 29—Dr. E. M. Hammes, St. Paul—Problems in Psychiatry.

Oct. 6—Dr. H. M. N. Wynne, Minneapolis—Gynecology.

Oct. 13—Dr. W. A. Plummer, Rochester—Goiter.

Oct. 27—Dr. S. M. White, Minneapolis—Heart.

Nov. 3—Dr. A. F. Bratrud, Minneapolis—Injection of Varicose Veins.

Nov. 10—Dr. Norman M. Keith, Rochester—Dehydration.

Nov. 24—Dr. W. W. Lewis, St. Paul—Middle Ear.

Dec. 1.—Dr. C. W. Waldron, Minneapolis—Oral Diseases.

Cost—$130.00. Average attendance—19.

WINONA

Jan. 14—Dr. F. A. Willius, Rochester—Some Principles Underlying the Treatment of Heart Failure.

Jan. 28—Dr. Norman M. Keith, Rochester—Diagnosis and Treatment of Nephritis.

Feb. 11—Dr. W. A. Fansler, Minneapolis—Diseases of the Rectum.

Feb. 25—Dr. W. A. Plummer, Rochester—Diseases of the Thyroid.
Mar. 11—Dr. J. F. Weir, Rochester—Jaundice.
Mar. 25—Dr. B. F. Davis, Duluth—Traumatic Infections.
Apr. 8—Dr. W. H. Goeckerman, Rochester—Dermatosis.
Cost—$92.00.

MANKATO

Dec. 4—Dr. Moses Barron, Minneapolis—Cardiac Decompensation and Treatment.
Dec. 11—Dr. G. B. Eusterman, Rochester—Unfamiliar Lesions of the Stomach, with Differential Diagnosis.
Dec. 18—Dr. Edward Cathcart, Rochester—Infections of the Lower Urinary Tract.
Jan. 8—Dr. John F. Madden, St. Paul—Dermatology.
Jan. 15—Dr. F. J. Hirschboeck, Duluth—Borderline between Internal Medicine and Psychiatry.
Cost—$96.00. Average attendance—15.

DULUTH

Colloquium Series, Winter of 1931

Correspondent—Dr. F. J. Hirshboeck, Duluth, Minnesota.

Dec. 15—Dr. W. A. O'Brien—Pathology.
Dec. 29—Drs. S. H. Boyer, L. Sogge, N. O. Pearce, E. A. Meyerding—Meeting under the Auspices of the State Medical Association.
Jan. 12—Drs. J. A. Myers, Walter H. Ude, A. T. Laird—Meeting under the Auspices of the Minnesota Public Health Association.
Jan. 26—Meeting under the Auspices of the State Board of Health.
Feb. 9—Dr. Irvine McQuarrie, University Medical School—The Nature and Treatment of Various Convulsive Disorders of Infancy and Childhood.
Feb. 23—Dr. T. L. Birnberg, St. Paul—My Impressions of Russia, Particularly from the Medical Aspect.
Mar. 9—Dr. F. H. K. Schaaf, Minneapolis—Recent Advances in Therapeutics.
Mar. 23—Dr. Frank Whitemore, St. Paul—Injuries to the Skull, Vertebræ and Peripheral Nerves.
Cost—$80.00.

REPORT OF THE CONSULTATION BUREAU

January 1, 1930, to January 1, 1931

NUMBER OF INQUIRIES RECEIVED ACCORDING TO MONTH

January	7
February	5
March	3
April	20
May	22
June	12
July	5
August	8
September	10
October	10
November	3
December	5
Total	110

TYPES OF INQUIRIES RECEIVED

Case reports requesting: General Information; Diagnosis; Prognosis; Treatment of Diseases; Reading of Dental Films, and Reading of X-ray Pictures.

Other letters for general information requesting: Information Regarding Schools; Books; Patent Medicine; Blood Test to Prove Paternity; Drugs; Analysis of Food Products; Teeth, and Immunization. Medicolegal Matters; Apparatus and Appliances; Locum Tenens and Locations and Placement in State Institutions.

Many of the case reports were followed by further inquiry.

Gilbert J. Thomas, *Chairman.*

Dr. Manley: This committee has submitted a very full report, and they particularly ask for suggestions from the delegates and members as to how they can improve their work. The Reference Committee commends this report and recommends its adoption.

Upon motion regularly made and seconded the report was accepted.

President Sogge: The report of the Heart Committee.

REPORT OF HEART COMMITTEE

In answer to your note of February 17 requesting a report of the Heart Committee of which I happen to be acting chairman, I regret to say that after conferring with Dr. Hirschboeck, we have no report of any definite progress having been made. The plans outlined to you in the report by Dr. Hirschboeck last year are still in the immature stage and have as yet not been crystallized. We still have the idea of having, at some time, a series of articles on cardiac subjects appear regularly in the Minnesota Medicine. A number of local societies are devoting a little time at each meeting for a discussion of cardiac problems and a few speakers on cardiac subjects have been requested to appear before local or groups of local societies.

There has been no recent meeting of the Heart Committee to my knowledge but the ideas that were discussed and accepted at the last meeting still retain their value and when put into execution, will undoubtedly be of definite benefit.

Respectfully yours,
H. E. Richardson,
Acting Chairman.

Dr. Manley: The Heart Committee has no definite report. They are working slowly. We recommend the adoption of this report.

Dr. H. E. Richardson (St. Paul): The only point I would like to emphasize is that the Heart Committee would welcome any coöperation from the secretaries of the various component societies so that we could work out a series of short talks—in other words the development of a speakers bureau.

Upon motion regularly made and seconded the report was adopted.

President Sogge: Next is the report of the Committee on Medico-Legal Affairs.

REPORT OF COMMITTEE ON MEDICO-LEGAL AFFAIRS

The following is a report of the Committee on Medico-Legal affairs, for the current year:

1. An investigation of the conduct of certain attorneys in handling a malpractice suit, was requested by a member of this Association, with a view to possible disbarment proceedings as a result of unprofessional and unethical conduct. A quiet investigation of this has been carried on, and at this time is not fully complete, but it is the belief of this committee, at this time, that while the ethics of the legal profession were definitely violated by these attorneys, there is not sufficient foundation for disbarment proceedings. Opinions have been sought and obtained from attorneys in the State Bar Association, and they concur in this belief. The matter has not yet been disposed of, but in all probability this investigation will not bring the results desired by the member of this Association.

2. This Committee has studied the file submitted by secretary's office, in December, 1930, concerning the decision of the Supreme Court in a malpractice suit against certain members of this Association, which apparently nullified the Statute of Limitations. The case has been very thoroughly studied by the Chairman of this Committee, but in view of the present legislative situation, it has been deemed unwise to take active steps at this time. The file is being held for such action in the future as it may seem best to take.

3. No further definite action has been possible concerning the enactment of legislation regulating expert testimony in criminal cases. This matter was referred to in our report of last year, and we feel, at this time, just as we did then—that it is a desirable objective. We realize, also, that it requires a constitutional amendment, and that the legal profession, properly should lead in this measure. We feel that this objective should be borne in mind and we shall endeavor to work toward it, to the best of our ability.

Other than the above, no matters have come to the attention of this Committee.

W. H. Hengstler, *Chairman.*

Dr. Manley: We move that the report of this committee be accepted.

The motion was seconded and carried.

President Sogge: Now the report of the Committee on Schools for Laboratory Technicians.

REPORT OF THE COMMITTEE ON SCHOOLS FOR LABORATORY TECHNICIANS

In our last annual report made at the Duluth meeting, we suggested several things.

The first was that the Legislative Committee of the Minnesota State Medical Association take steps to enact laws controlling these Schools of Medical Technology. The time is not quite ripe when this should be done.

Another recommendation we made was that Dr. Kano Ikeda, a member of the American Society of Clinical Pathologists, be made a member of our Committee. This society has formulated a standard for laboratory technicians and is conducting a registry of technicians. They are now at work on formulating a standard for Schools of Medical Technology, and that is why we deemed it advantageous to have Dr. Ikeda a member of our Committee.

Since making our last report, two members of the Minnesota State Medical Association, were asked to discontinue their association with a certain school of Medical Technology, by the Executive Committee of their County Society. They did so in a most courteous manner.

Beyond this your Committee on Schools for Laboratory Technicians has not done much work because we are waiting for the American Society of Clinical Pathologists to finish their standardization for Schools of Medical Technology and then we will have something definite to talk about, and a standard to be followed, and the Schools of Medical Technology will either qualify by coming up to this standard or fail to do so.

A. G. Schulze, *Chairman.*

Dr. Manley: The Reference Committee commends the action of this committee in persuading two members of the State Association to discontinue their affiliation with a certain school of medical technology. We move the adoption of the report.

Upon motion regularly made and seconded the report was adopted.

President Sogge: The report of the Committee on Public Health Nursing.

REPORT OF THE COMMITTEE ON PUBLIC HEALTH NURSING

There has been only one meeting of this Committee since the last meeting of the House of Delegates and no business has been transacted. This meeting was at the St. Paul Hotel at the time of the Secretaries Conference. Dr. George Earl, Dr. T. E. Flinn and Dr. C. B. Wright were present.

The chairman has had numerous interviews with Miss Olivia Peterson in regard to an amendment to the Public Health Nursing Law providing that all nurses doing public health nursing work should be certified by a committee, the personnel of which was never quite settled upon. There were objections to this amendment on the part of sanatorium men and it was decided, therefore, on the part of Miss Peterson and her committee, not to present this amendment at this session of the Legislature.

There was no other business coming before the committee.

Respectfully submitted,
C. E. Caine,
George Earl,
T. E. Flinn,
C. B. Wright, *Chairman.*

Dr. Manley: The Reference Committee moves the adoption of this report.

Dr. Wright: The only thing I have to say is that I have spent quite a bit of time working with the University public health nursing school and I think we have accomplished a good deal. In other words, I think it is a good thing to have this committee. They tried to introduce a bill which would require all nurses loing public health work to take a course at the Uni-ersity before they could engage in such work. The dea, I think, is all right, but there was quite an ob-ection from some of the sanatorium men, some of hom train their own nurses, and we were able to kill he bill. The committee is doing quite a good work and think it should be continued.

Upon motion regularly made and seconded the report as adopted.

President Sogge: The report of the Committee on ontract Practice.

HE COMMITTEEE ON CONTRACT PRACTICE

The Committee on Contract Practice, consisting of ine members appointed December 9, 1930, has not ad any meeting during the year. The chairman re-uested the members, in a form letter, to suggest sub-ects which might be discussed or acted upon by this ommittee, and also requested an expression as to hether members wished to have a meeting. The gen-ral feeling was that a meeting was not necessary as here was nothing of importance to bring up for dis-ussion.

The Committee's report of 1929 was to the effect hat the situation as to contract practice was satis-actory to all concerned, and it was the sense of that ommittee that it should confine its activities to con-ideration of complaints on contract practice, as rought to its attention during the year. There have een no such complaints submitted for the attention of his committee.

Inasmuch as the tendency of the times seems toward roup practice in its various modifications, this com-ittee has not felt it wise to attempt any new line f investigation. Discussions of this subject in the terature is free and voluminous in publications deal-g with the economic side of medical practice. The tuation seems to be in a state of flux.

This committee, therefore, finds nothing definite upon hich to make recommendations for action by the tate Association.

Very truly yours,
Arthur N. Collins, *Chairman.*

Dr. Manley: The Committee on Contract Practice as not had a meeting during the past year. The Ref-rence Committee believes that there is a very large eld and a lot to be done in this line. We recommend hat the title of this Committee be changed to that of ndustrial Practice and that the committee be appointed the Council instead of the President, and that a esolution, by the Minneapolis Surgical Society which ill be considered in a few minutes, be handled by his new committee.

Upon motion regularly made and seconded, the re-ort was adopted.

President Sogge: The Committee on Military Af-airs.

Dr. Ralph T. Knight (Minneapolis): During the resent spring the county medical societies have been sked to appoint Military Affairs Committees, and a umber have already been appointed. This will give the state committee an opportunity to assist the local committees in—First—Arousing among eligible physicians interest in obtaining commission in the Medical Reserve. Second—Spreading information and enthusiasm among commissioned physicians so that they will retain their commissions and will advance in grade. Third—Keeping the profession as a whole informed as to what medical men are doing in military preparedness.

This committee will have from time to time some short bits of information which we would like to have inserted in Minnesota Medicine. It has been suggested by one of the members of the committee that there be a monthly department of a part of a column for Medico-Military facts, history, news and policies.

Dr. Manley: I move the adoption of the report of the Committee on Military Affairs.

The motion was regularly seconded and carried.

President Sogge: The report of the Committee on State Health Relations.

REPORT OF COMMITTEE ON STATE HEALTH RELATIONS

The Committee on State Health Relations has no definite recommendations to make to the House of Delegates at this time. Matters coming up through the year have been taken up with Council as they arose. We are studying the problem of local public health administration, with special reference to the "full time county health units" which have been advocated repeatedly. The medical profession has taken no stand, and no recommendation will be made by your committee until it has studied the matter further and obtained the views of the physicians in the various parts of the state.

Theodore H. Sweetser, *Chairman.*

Dr. Manley: I move the adoption of the report of this committee.

Dr. E. S. Boleyn (Stillwater): This committee met only twice during the past year and considered several things, but there wasn't anything in particular done.

Upon motion regularly made and seconded, the report was adopted.

President Sogge: We will now take up the resolution submitted by the Minneapolis Surgical Society.

RESOLUTION

Whereas, in the recent controversy over the reappointment of a member of the Industrial Commission statements were made that some members of this association were unfair to the employee by attempting surgical procedures for which they were not competent and were unfair to the insurance companies in their fees; and,

Whereas, there should be no antagonism but a feeling of kindly coöperation between the various agencies responsible for the care of injured employees.

Be it resolved that the State Medical Association appoint a committee whose purpose it will be to cooperate with the Industrial Commission in ascertaining the facts in cases where unfairness or incompetence is charged to members of this association, and to act as a group for the arbitration of all controversies.

James M. Hayes, *Chairman.*

Dr. Manley: The Reference Committee approves of this resolution and moves its adoption, and recommends that the committee suggested be given charge of these controversies relative to insurance companies. We thought that instead of the name Committee on Contract Practice, it should be changed to the Committee on Industrial Practice. A lot of men objected to the old name, and it really is a narrow definition, and the whole thing comes under industrial work, and if that committee is appointed, if our recommendation is accepted, we thought that things of this sort coming up would be handled by that committee.

Dr. J. M. Hayes (Minneapolis): The only object of this was to do away with some of the enmity of the insurance companies. Some of the things brought out in the Duxbury case were where doctors had rendered unfair fees and such things as that. We thought this might at least give the insurance companies the idea that the State Medical Association did not approve of that but rather wished to coöperate with the insurance companies in the matter of caring for the employees rather than being antagonistic to them. We thought especially that this committee already was composed entirely of so-called industrial surgeons, and we believed that if the committee could be composed of mixed surgeons rather than entirely industrial surgeons, better results might be accomplished.

Dr. Adams: In what manner does the committee act as an arbitration board?

Dr. Manley: The insurance company claims you are charging too much for your work. The committee takes it up and adjusts it.

Dr. Boyer: The purpose of that committee is to iron out certain difficulties; in other words, this committee gives us a chance to secure fair fees for the man who does work for the Industrial Commission, and gives us a chance to clean house ourselves instead of having the Industrial Commission do it. To present a glaring situation: Some man got a piece of iron in his side. The doctor was unable to extract it, but continued seeing the man every day or so until he had run up a bill of some $500.00, which the insurance company was obliged to pay. When his services were terminated the man was taken to a competent physician who extracted the piece of iron and in a few days the man was well. Such a matter as that would come under the cognizance of this committee.

President Sogge: You understand the Committee on Contract Practice is abolished by this motion and a new committee on Industrial Practice is to be appointed by the Council.

Upon motion regularly made, seconded and carried the resolution was adopted.

President Sogge: Now we have the report of the Special Committee to Study the Policies of the State Association.

Dr. O. E. Locken (Crookston): It was impossible to have this report written so you men could have it beforehand. We just presented it to the Council today. I might say this report has been discussed by the officers for three hours this morning and for three and a half hours this afternoon by the Council. I wish to ask for the privilege of reading the entire report first and then re-reading the summary and having the House of Delegates act upon the parts of the report.

REPORT OF SPECIAL COMMITTEE ON POLICIES

At the 1930 meeting of the House of Delegates of the State Medical Association in Duluth, the following resolution was passed:

"That a committee of five be appointed by the President to make a careful study of the policies of the State Medical Association, particularly along the lines of the consideration of the problems and development of the County Societies, of re-districting of the Association, accumulation of Reserve Fund, the organization of permanent committees, and changes in the personnel, on the duties of the executive officers, and to make such recommendations as they deem advisable for the best interests of the association and the component societies."

An amendment requested that this report be submitted to the Council for their opinion.

Dr. S. H. Boyer, President, appointed the following committee: O. E. Locken, Chairman, Frank Burch, W. A. Fansler, J. R. Manley, Waltman Walters.

This committee has made a study of the policies of the State Medical Association during the period of expansion since 1925. The committee has attempted to evaluate the activities of the society and to make certain recommendations which, it believes, will promote further service to the Association, the Profession, and the Public.

QUESTIONNAIRE

To assist the committee in determining the sentiment of the component societies on certain questions of policy, a Questionnaire was sent to the Secretaries of all of the County societies. Replies were received from 25 of the 36 societies. The 11 societies not returning answers have a total membership of 223 members or approximately only 10 per cent of the membership of the State Association.

Having the majority opinion of the majority of the societies with 90 per cent of the total membership, we felt that we had at least a general basis to judge the sentiments of the members of the Medical profession of Minnesota. We find that in general there is a definite satisfaction with the present system of organization, its policies and its accomplishments. There are some criticisms and some suggestions for improvement. These will be considered in the report which we, as a committee, have been asked to present.

REPORT

I. County Societies

The State Medical Association is made up of thirty-six component societies and has a total membership of

2,100 in 1930. Eliminating the four large societies of Hennepin, Ramsey, St. Louis and Olmsted, there are fifteen societies consisting of only one County. These have an average membership of 15. They are listed as follows: Blue Earth, 31; Dodge, 6; Freeborn, 17; Goodhue, 13; McLeod, 12; Meeker, 8; Mower, 22; Rice, 32; Steele, 9; Wabasha, 12; Waseca, 9; Washington, 13; Watonwan, 7; Winona, 24; Wright 14. The remaining societies consisting of more than one county are seventeen in number and have an average membership of 30.

It is the opinion of this committee that a Medical Society consisting of six or eight members must find it very difficult to maintain a constant high standard of scientific programs. We believe that it is a good policy for the average society to invite one or more guest speakers for some of its programs, but we candidly question if it is not an imposition to invite a guest speaker to travel a long distance to address a dozen men. We strongly recommend that an attempt be made by the smaller individual county societies to combine with one or more adjoining societies with the view of bringing their membership up to the average of 30 which the combined county societies have.

The individual county societies are in the Southern part of the State where the counties are small. With the automobile and the excellent highways there is no hardship to travel 25 to 50 miles to a meeting in the afternoon or evening. This step of combining societies along the lines suggested should be worked out by the societies themselves. We urge that the councilors in the districts affected should take the leadership in this redistricting of their societies.

II. Southern and Northern Minnesota Medical Societies

With greater emphasis placed on the local society, with the widening activities of the State Association, with the development of local hospital staff meetings, the average physician is beginning to feel that the demand on him to attend medical meetings is becoming too heavy. As a result there has come from different sources the suggestion that both the Southern and Northern Medical Societies be eliminated. Seven of the 25 societies who replied to the questionnaire expressed the desire that these two societies be eliminated. It is apparent that the majority feel that they be continued. It is our opinion and we so advise that the Northern Medical Association modify its plan to a one day session similar to that of the Southern Association. County Medical Societies could reduce the number of their meetings by one. The Southern or Northern Minnesota Society meetings could then be considered as one of the meetings in the series of each county society. This will overcome the objection of an additional meeting and will not detract from the State Association.

III. Administrative Organization of the State Association

The present plan of administration of the State Association is patterned after the earlier forms of representative democratic government. There seems to be no disposition to change to a direct election of officers such as we have now in civil life. The delegates selected by the component societies choose the council and the executive officers. Men are elected to office largely on their record of service to the Association. They have served an apprenticeship in committee work, in the House of Delegates, or in the Council until they are thoroughly familiar with the Society's problems.

The average doctor living an individualistic life has little opportunity to develop administrative ability. The increasing complexity of demands on the medical organization requires that it select its officers not only from men with scientific attainments, but from men who have served along the line of society activities until they are prepared for the higher positions. This idea is presented because from time to time criticism is heard presenting the feeling of dissatisfaction that the same old group is running the affairs of the organization year after year to the exclusion of other equally able men.

As rapidly as men show an interest in society problems and a willingness to give of their time, energy and money to serve the medical association, the State Association, in our belief, has always been and is ready to invite them to make those sacrifices. For these reasons the committee believes that the present policies are effective, satisfactory and essential.

IV. The Enlarged Program of Activities, Scientific, Educational and Legislative

1. Everyone seems to be satisfied with the constant improvement in the standard of scientific programs given at the Annual Meeting of the Association. This committee has no suggestions to make in reference to the scientific features of our State programs. However, the policy of permitting local committees of the host city to control arrangements other than the housing and entertainment is fundamentally wrong and is the cause of irritation and confusion. Space and arrangements for commercial and scientific exhibits should all be handled through the State central office. The income from exhibit space should go to the State Association. Expenses by the host city should correspondingly be assumed by the State Association from the revenues obtained. All details of program, selection of presiding officers at sectional meetings, speakers at banquets and every other detail of the arrangements for the meeting should be in the hands of the state rather than a local committee. We suggest that action be taken to establish this as a policy for the future.

2. The Public Health, State Medicine Relations and Economic Educational programs have been developed primarily for the purpose of creating public opinion favorable to scientific medicine as well as educating the public to the needs and benefits of higher standards of individual and community health. The results of such a program are of necessity intangible for it will always be impossible to strike a balance sheet on the benefits of a particular educational policy.

A variety of activities has been fostered to create a greater interest in Public Health education by the active committees in charge. Next to the Legislative Committee these various committees together have spent the largest sum of money in the budget of the Association. The use of Public Health Journals, Hygeia, Everybody's Health, Radio Talks, medical speakers for various groups such as Parent-Teachers and Educational Associations, weekly newspaper health stories mailed to rural newspapers and group meetings with the physicians themselves to encourage local medical leadership, have occupied most of the energies of these Committees.

These general efforts are of great indirect value. They represent a pioneer work of focusing the attention of the profession and the public on the importance of a properly conducted public health program. In addition to these activities it is our opinion that the State Association should particularly emphasize and center its efforts of public health education in the future on the following objectives:

a. Medical leadership should be encouraged in the County Public Health Associations which are the units of the Minnesota Public Health Association. To insure that medical leadership in County Health Associations will be provided for, we recommend that each component County Society appoint annually a special committee of its members whose responsibility it shall be to join and participate in the activities of each county Public Health Association and to keep the County Society informed of their Public Health Activities. A similar committee should be appointed for each county to make contact with the Red Cross organization. The importance of this is self evident unless we are willing to submit to the errors consequent to the inevitable lay leadership of local public health activities, free clinics and cultist influence.

b. Constant contact with the Public Health Nurses organization should be continued to avoid the difficulties of a few years ago when Public Health nurses had less of an understanding of the viewpoints of the Medical Profession in regard to Public Health.

c. Coöperation should be developed with the special committee which was appointed by the Minnesota Editorial Association for the purpose of creating a better understanding of the viewpoints of the Medical profession in regard to the subject of advertising. There is no disposition on the part of physicians to change their long standing ethics on this subject. There should, however, be a disposition to foster a friendly feeling with the newspaper profession for the mutual benefit of the public, the publishers and the doctors. Control of quack advertising, the presentation of scientific facts to the public in place of the customary news stories of unsupported, unestablished scientific discoveries can only come when the doctor and the publisher have established a different relationship than exists today. Conferences for the purpose of creating a better understanding of this problem can do no harm and may bring new viewpoints of value. It is recommended that county societies be required to appoint a special committee to serve in each county for the purpose of making contact with the newspapers. Such a committee could also add to its field the troublesome problem of regulating medical speakers before lay audiences. Such regulation is for the purpose of avoiding irritation in the profession itself, reducing to a minimum undesirable professional publicity and to safeguard the public in the type of information given them.

d. University Relations. Most of the physicians practicing in Minnesota are graduates of our own University. Most of the future practitioners will be graduates of that institution. It is natural, therefore, that the State Medical Association has a hearty interest in the education and training of Medical students. There is definite evidence that whenever and wherever medical men convene and discuss the subject, that the University Medical School and Hospital have not even half-hearted support of the profession. Underlying this is the considerable difference of opinion on such questions as pay patients or free patients in dispensary and the University Hospital; a teaching staff comprised of scientists who have never engaged in the private practice of medicine; a students health service providing complete medical and surgical facilities to rich and poor alike, with an increasing emphasis on the treatment of disease rather than only its prevention, and increasing tendency to produce laboratory trained physicians at the expense of such additional factors in the practice of medicine that lead to the field of ethics, philosophy, psychology, economics, community contacts, and medical association problems, all of which occupy so much of the average physicians life and success.

We strongly recommend the continuation of a Public Policy Committee known as the University Relations Committee, to work regularly with a similar Committee from the Medical School and a Committee from the Medical Alumni Association. Such a committee might well aid or advise in formulating policies, regarding the recommendation and admission of patients to the University Hospital, discuss and formulate plans for extra-mural teaching, University Extension courses, and Public Health Clinics, in which the University teachers take part or coöperate with the local medical bodies, aid in securing University appropriations and funds for University research, for hospital development and for endowments. Such a committee should serve as a clearing house of sentiment and an aid to the President of the University and the Dean of the Medical School regarding problems of medical education, clinical teaching, and qualification standards.

It is our opinion that successful contact with these four groups: The Minnesota Public Health Association, The Public Health Nurses Association, the Minnesota Editorial Association and the University, will increase the value of the general medical educational program for the public through such agencies as lectures, radio talks, clinics, and news service. In making this suggestion we fully recognize the successful methods in which these general agencies have been carried out. To attack the problem of public health education from the basis now recommended we believe is fundamental and more productive of lasting results.

3. The activity of the State Association in medical legislation in the past six years has received greater emphasis than any other effort of the Society. The achievements have been so striking as to represent an entirely new era in the history of our Association. The most important acts were the passage of the Basic Science Law which prevents untrained cultists to practice the healing art in Minnesota; the revision of the Medical Practice Act requiring higher standards of training and practice; the reduction of the period in which malpractice suits could be started from six to two years; the Massage Bill placing the licensure in the hands of the State Board of Medical Examiners, thereby restricting the unlimited use of the title of Doctor by the masseurs; the securing of $25,000 appropriation for research work at the University; the continuation of the Venereal Disease laboratory of the State Board of Health; the prevention of fees for medical service being dictated by the Workmen's Compensation law. Other more indirect results of value were accomplished by the prevention of the passage of such bills as anti-vaccination, anti-vivisection, cultists practicing in tax supported hospitals, the licensing of naturopaths to treat the sick, and the permission of osteopaths to increase their rights to practice allopathic medicine.

A summary of such a varied program of medical legislation gives an understanding of the aggressive front which the medical profession has taken both in its own behalf and in the protection of the public.

Because this program has cost considerable money there has been a reaction on the part of some members of the Association against it. Others have objected to the work on the principle that the methods used to accomplish the results are objectionable.

From answers to the Questionnaire, twenty-three of the twenty-five societies replying were satisfied. One was tolerant and in one society from which individual reports were received from 26 per cent of the membership, 25 per cent of those answering were not satisfied. This group comprised 6 per cent of the total membership of the society.

In view of this nearly unanimous expression of satisfaction with the work of the legislative program of the State Association, this committee, in analyzing its results, merely wishes to confirm the general opinion that the legislative committee has accomplished a heroic work, that its members have sacrificed much of their time and energy, that we have the fullest confidence in the judgment of the men who have continued the six year fight for medical legislation. We find that the State Association has rewarded these men in the only manner at its command, by electing them to the honor of the highest positions in the state organization.

The following principles can be accepted as the policy of this Association: (1) That Association expenditures for legislative purposes be predetermined by special budget of the council and such a special fund be audited as in the past by the council. That such expenditures be kept within this budget. (2) That lobbying in the interest of legislation affecting medical practice and Public Health be maintained as far as possible on a basis of advancing information as to the views of the profession and the needs of the public.

We believe that the policy of not asking for any further legislation from the 1931 legislature should, as far as possible, be continued through another session.

The excellent relationship which now exists between the legislature and the medical profession could best be maintained by asking for no further favors other than the maintenance of the high standard of medical legislation now on the statutes of Minnesota.

V. Financial Reports and Dues

The committee has reviewed the audits of the State Association since 1925 and presents a comparative outline of the main divisions of income and expenditures covering each of the years from 1925 to 1930, a chart of which is hereby submitted.

Year	1930	1929	1928	1927	1926
Investment Fund	$23,737.37	$22,735.76	$21,000.00	$11,700.00	$ 9,000.00
Income	31,140.00	30,924.75	31,200.00	30,419.00	10,185.00
1. Dues	27,014.00	26,818.75	27,084.00	26,391.00	6,157.00
2. Subscriptions	4,126.00	4,106.00	4,116.00	4,028.00	4,028.00
Magazine	12,408.91	12,562.63	12,619.18	12,755.00	13,982.95
Miscellaneous and interest	537.57*	1,296.58	1,340.74	687.11	817.36
Total income	$39,960.48	$40,677.96	$41,043.92	$39,834.03	$20,957.31

*Less $1,001.61 interest on and added to Investment Fund.

EXPENDITURES

	1930	1929	1928	1927	1926
Administrative	$10,670.48	$10,674.67	$ 8,967.62	$ 9,086.73	$ 6,238.72
Committees:					
Education and Legislation	5,117.03	18,361.52	2,296.39	14,254.59	143.85
Public Health	5,899.06	4,274.90	3,737.71	2,033.77	3.00
Minnesota Medicine	14,023.37	12,090.12	11,833.07	12,679.94	13,057.86
Miscellaneous	262.37	....	....	....	....
Total	35,972.31	46,026.71	27,155.32	38,070.28	19,443.43
Deficit or Surplus	+3,988.17	—5,348.75	+13,888.70	+1,763.75	+1,513.88

1925
Special assessment for legislation
$6,971.09—1925
2,335.00—1926
$9,306.09

1925
$5,145.12 spent in 1925
4,160.97 spent in 1926

The following facts are observed:

Since the dues were raised in 1927, the annual income has doubled and has so remained approximately $40,000.00 from dues, magazine, and interest. The membership of the State Association remains the same, approximately 2,000 members.

The income of the magazine remains the same, approximately $12,000.00.

A review of expenditures shows that expenses for administration have advanced from approximately $6,000.00 in 1926 to $10,000.00 in 1930 but that there has been no increase in the past two years, indicating the arrival now of a fixed policy.

The expense of the legislative program has been variable in relation to the legislative years. The expenditures of approximately $14,000.00 and $18,000.00 respectively in 1927 and 1929 undoubtedly represent the peak of funds that will have to be expended for such purposes. With the fundamental laws on medical legislation now on the statutes, the State Association must concern itself chiefly with holding the ground that it has gained. A policy of defense can not require as great a cost as the heavy work of offense in the past few years.

The expenditure of funds for Public Health education, State Medicine and economic study and contacts from $3.00 in the year 1926 has been increasing at the rate of about $1,000.00 a year until it became approximately $6,000.00 in 1930. We have already in previous sections of this report presented recommendations for the immediate future policy of this activity. Following these suggestions further increases will probably not be necessary.

The expenditure for our magazine, MINNESOTA MEDICINE, has remained essentially the same until 1930 when it increased $2,000.00, to a total of approximately $14,000.00. We feel that our medical journal has been constantly improving and that these expenditures are acceptable to everyone.

The question of the present dues is entirely a matter of the general policy of the State Association directed towards the two flexible divisions of our activities, legislation and Public Health education. In replies to the Questionnaire on this subject only three of the 25 societies expressed the desire that the dues be reduced, most of them felt that they should be maintained but should not be increased. This committee feels that annual dues of $15.00 since 1927 have been essential and that the income derived has been properly spent to carry out the wishes of the majority of the State Association.

The future level at which dues shall be placed must depend wholly upon the activities which the society fosters. This can only be determined from year to year. It would be unwise to make any change until the results of the present policies can be further evaluated. Two years from now we will be in a better position to determine that question. Until then no further action should be taken.

The Investment Reserve fund now totaling $23,737.37 is the result of a gradual accumulation of savings over a great many years. The money is invested in high class bonds. Additions to this fund in the past years have come only from the earnings of interest from the fund itself. The advisability of continuing this policy has been questioned by some members. It has been created primarily because of a general policy of all business and fraternal organizations to protect themselves with some form of reserve fund. There has been no disposition on the part of the officers of the association to use any part of this accumulated fund for expenses of running the association. It has been suggested that it might be used for needy physicians, for scientific research, for the promotion of scholarship at the medical school or be kept only as an emergency fund for any unusual demand on the association which might arise.

It is our opinion that this fund should be allowed to increase and that additions to this fund should come as in the past from savings in the management of the State Association. We recommend that prizes be given for scholarship to medical students. Such an act would at once foster a contact between the undergraduates and the State Association, a relationship which is obviously advisable and of value to both. An annual stipend for a graduate fellowship in special investigative work would also indicate our interest as a profession in medical education. The interest earned on our reserve fund should carry such a policy.

VI. Minor Questions

Various other questions have been brought to the attention of the committee for consideration.

1. Shall the Medical Journal stress other subjects than scientific and Association reports? So much is being written on the economic side of medical practice in lay magazines that there is some demand that these subjects be discussed in our Journal. It is our opinion that any steps taken in that direction should be taken very slowly. Special articles and editorials on this subject from time to time should be welcome but it is not advisable at this time to create any special department in the magazine on economic questions. The subject of economics should be left to the Editorial Committee.

2. The Reference Committee in one of its reports to the House of Delegates recommended that the office of Secretary and Treasurer be combined to expedite the routine business of the Association. In view of the policy of having all accounts audited by certified public accountants, a separate Treasurer's report has been considered less essential. The expenditures of funds is now wholly at the discretion of the Council. If in the opinion of the Councilors the combining of the offices of Secretary and Treasurer will increase the efficiency of their routine business such a change should be made. Our committee feels that the House of Delegates should take no action except on the recommendation of the Council.

3. The Association has employed a group of attorneys, Oppenheimer, Dickson, Hodgson, Brown and Donnelly, for many years. In recent years Mr. Brist has done

much work for our Legislative Committee. He is also the Attorney of the Board of Medical Examiners and as such has carried on the successful prosecution of illegal practitioners of medicine. We believe his work will be more effective if he is not in the direct employ of the Medical Association as its regular attorney. Representing the State Board of Medical Examiners rather than the medical profession, places him in a stronger position before the Courts. We, therefore, recommend that the present relationship be continued and the present group of Attorneys be retained as in the past. Mr. Brist, however, could be employed as a special attorney by any committee authorized by the Council for any special purpose and for which a suitable retainer's fee should be paid.

SUMMARY OF RECOMMENDATIONS

1. That the small individual county societies should combine when feasible, with adjoining societies to bring their membership up to approximately the average of 30 now existent in the other combined county societies.

2. That the Northern Minnesota Medical Association limit its annual meeting to a one day program. That both Northern and Southern Societies meetings should be considered as one of the annual series of the County societies in their respective district.

3. That the present plan of administration of the State Association be continued.

4. That all arrangements for the Annual Meeting be handled by the State central office and by State committees with the exception of such matters of entertainment that the local host city is prepared to give. That income from commercial exhibits should go to the State Association and that it in turn should correspondingly assume expenses for the meeting.

5. That the Public Contact Program be continued as in the past and special emphasis directed toward: (1) Medical Leadership in County Public Health Associations. (2) Constant contact with the Public Health Nurses Association. (3) Coöperation with the Minnesota Editorial Association. (4) Coöperation with the University Medical School.

6. That in the policy toward medical legislation the Association appreciative of the present high standard of medical statutes as far as possible ask no further immediate favors from the legislature except to continue the principles now established; that expenditures for legislative activities be budgeted and audited by the Council.

7. That toward the problem of finance the Association restrict its expenditures in both legislative and educational activities to a level that can be met with its income.

8. That the policy of developing a reserve fund from savings in the management of the Association be continued. That when deemed feasible steps be taken to give prizes and scholarships, both undergraduate and graduate, to the students of the medical School to indicate the interest of the Association in medical educcation.

9. That the Medical Journal MINNESOTA MEDICINE continue its present policy of serving as an organ for scientific articles and association activities. The subject of Economics should be left to the Editorial Committee.

10. That the question of combining the offices of Secretary and Treasurer be decided on the recommendation of the Council.

11. That the present group of Attorneys of the Association be retained.

CONCLUSION

The committee which was appointed by Dr. Boyer to prepare this report consists of men who have had no direct relation with the organization of the activities of the State Association in the years of its expansion. We have approached each question of policy from as unbiased a viewpoint as possible, attempting to base our recommendations both by ascertaining the sentiment of the entire membership of the association, and by exercising freely our own judgment. We trust this report will serve as a basis of information of the essential policies and activities of the Minnesota Medical Association. In analyzing the work of the Association the committee has itself obtained an appreciation of the achievements of the Society. We hope the general membership will be equally stimulated by reading this summary of the efforts of the Association. The Minnesota Medical Association has been in the hands of high minded, capable men. We anticipate that it will continue to be so in the future.

As a special committee we wish to express our appreciation for the courtesies that have been extended us from the officers, the component societies and the entire membership in assisting us to obtain the information on which the report is based.

O. E. LOCKEN,
FRANK BURCH,
W. A. FANSLER,
J. R. MANLEY,

PRESIDENT SOGGE: I think the only way we can get at this is to have Dr. Locken read the summary, paragraph by paragraph, and take action on each paragraph.

DR. WRIGHT: I wonder if it would be possible for the members to talk this thing over and discuss this report at the meeting tomorrow.

SECRETARY MEYERDING: We hope the House of Delegates will convene tomorrow at 11:30 A. M. in Parlors O. P. and Q, where luncheon will be served. I don't know how much business will come up tomorrow; we have election of officers, but perhaps this could be taken on.

DR. ROBBINS: I move that we lay the report over until tomorrow.

DR. KLAVENESS: In order that you may know my opinion about the whole report, I would say it is the most interesting analysis of the functions of our State Association that I have ever listened to, and the Committee has certainly done itself proud by covering the field so completely. However, while I concur with the recommendation that the smaller counties should join and make up into larger societies, they have apparently forgotten the policy of the State Association to recommend a redistricting of its Association with reference to the Councilor districts. I speak particularly for Wright County, which is adjacent to Stearns and Benton Counties. It is manifestly out of the question to expect that Wright, Stearns and Benton counties will ever have a councilor given to them when they are in with Hennepin County which has 524 members. We would be glad to join with Stearns and Benton counties and leave Hennepin County by itself.

President Sogge: You have heard the motion that we take up this report tomorrow. All in favor signify by saying "Aye." I think we had better have a division on that.

The vote was 26 to 24 so the motion is carried.

The Council recommends that Dr. T. R. Moran, St. Luke's Hospital, St. Paul, Dr. F. C. Mann, Mayo Clinic, Rochester and Dr. W. C. McCarty, Mayo Clinic, Rochester, be elected to associate membership. What is your wish?

Upon motion regularly made and seconded the recommendation of the Council was accepted and Drs. Moran, Mann, and McCarty declared associate members of the Minnesota State Medical Association.

President Sogge: There has been suggested a new plan for membership certificates, with the name of the local society and the local secretary. Dr. Meyerding will explain it.

Secretary Meyerding: At the Secretaries' Conference the question of adding to your membership certificate the name of the local society and the local secretary was discussed. I have a few proofs here of a suggested certificate. It means that in your office when you put up your certificate the name of your local medical society and your secretary would appear on it. We sent out a questionnaire to the various societies in the state and 26 reported favorably. The Council discussed this this afternoon and it thought the best plan would be to have the name of the local Society and the secretary's signature stamped in our office so every member would receive his certificate promptly. The size of the certificate will be the same as it has been in the past. The Council recommends that the new plan be tried for a year and that the certificates be mailed directly from the state office.

Dr. Robbins: I move that the plan be adopted.

The motion was regularly seconded, put to a vote and carried.

Dr. C. L. Scofield (Benson): It seems our By-Laws provide that the House of Delegates shall meet at 2:00 P. M. on the first day of the meeting. That is not necessary, and I offer this amendment to Chapter 5, Section 1; that the words "At 2:00 P. M." be stricken out, and that this be considered at the meeting tomorrow.

Dr. Robbins: I have this resolution to offer: "Resolved that the House of Delegates of the Minnesota State Medical Association go on record urging the component societies to incorporate in their public health educational programs a study of the health conditions of the Indian population, and its relations to the general public." I move that the resolution be referred to the Reference Committee for a report tomorrow at the meeting of the House of Delegates.

Upon motion regularly made and seconded the report was adopted.

Dr. N. O. Pearce gave a talk on Medical Economics, illustrated by slides.

SECOND MEETING OF THE HOUSE OF DELEGATES

The second meeting of the House of Delegates of the Minnesota State Medical Association at the Nicollet Hotel, Minneapolis, was called to order at twelve, noon, May 5, 1931, by President Sogge.

President Sogge: Gentlemen, come to order please. We will have the roll call.

Secretary Meyerding called the roll.

President Sogge: All those who have not turned in their credentials, please do so.

A summary of the minutes of the previous meeting was read by Secretary Meyerding.

President Sogge: Next is the report from the Council.

Dr. Workman, Tracy, read the report of the Council.

SECOND MEETING OF THE COUNCIL

The second meeting of the Council was held Monday night after the meeting of the House of Delegates adjourned.

The following were present: H. M. Workman, W. W. Will, M. S. Henderson, W. A. Coventry, F. J. Savage, A. G. Schulze, O. J. Hagen, Wm. A. Piper, and E. A. Meyerding.

The question of redistricting the Councilor districts was discussed. Motion made by Dr. Coventry, seconded and carried that a Committee of two Councilors be appointed to look into this matter of redistricting the Councilor districts and the amalgamation of some of the component societies. Drs. Coventry and Henderson were appointed.

The meeting adjourned.

President Sogge: We will have the report from Dr. Watson, Chairman of the Committee to Coöperate with the Editorial Association.

Dr. J. A. Watson (Minneapolis): Most of you know something about this Committee, about its conception and so on. The Editors started to interest themselves in the question of whether or not there should be a broader attitude on the part of the medical profession toward advertising. They soon saw that it was a matter of evolution that it would have to be left to the medical profession. One thing led to another until they requested that a committee from the Minnesota State Medical Association be appointed to confer with a committee of their own association, the Minnesota Editorial Association, with a view of establishing closer relations between the two professions, so that something would grow out of it in the future.

While we were very skeptical in the first place as to whether it would ever amount to anything, it has come to the point where those of us who were appointed members of the committee think that good might grow out of it and may result in something valuable to the medical and editorial professions. These committees had a breakfast meeting this morning at which the following men were present:

Dr. J. A. Watson, Minneapolis
Dr. S. H. Boyer, Duluth
Dr. H. M. Workman, Tracy
Dr. O. O. Larsen, Detroit Lakes
Dr. E. A. Meyerding, St. Paul
Mr. Roy Dunlap, St. Paul
Mr. J. Jones, Minneapolis
Mr. H. E. Soule, Minneapolis
Mr. A. E. McGowan, Minneapolis
Mr. L. Benshoof, Detroit Lakes

Mr. Benshoof was the originator of this whole question. It started rather acrimoniously and has settled down into something quite harmonious.

After a good deal of discussion the following resolution was adopted:

"Be it RESOLVED, That this conference favor the formation of an Advisory Board of Public Relations between the Minnesota State Medical Association and the Minnesota Editorial Association, consisting of five representatives of each organization. It is the sense of the conference that the representatives of the two associations be selected so as to have representation of the state at large."

President Sogge: What do you want to do with this report?

Dr. E. Klaveness (St. Paul): I move it be accepted.

Dr. W. A. Coventry (Duluth): As a substitute motion I move the report be accepted and the recommendation of the report that a committee of five be appointed, be carried out by the Council.

The motion was regularly seconded, was put to a vote and carried.

President Sogge: University Relations, Dr. Boyer.

Dr. S. H. Boyer: The University Relations Committee, after several meetings, has arrived at this conclusion and submits this report:

REPORT OF UNIVERSITY RELATIONS COMMITTEE

Members of the Committee on University Relations have coöperated with the Medical Alumni Association during the past year in studying various problems confronting the medical school. It became apparent that many of the shortcomings of the medical school had their origin in a lack of executive ability and of practical leadership on the part of the Dean. There was also considerable criticism of the methods employed in teaching the practical side of medicine. The Medical Alumni Association had come to a similar conclusion, and your committee endorsed a resolution which they sent to the Chancellor of the University and the Board of Regents, in which a change in the deanship of the medical school was requested.

We regret that the Chancellor of the University has not deemed it advisable to take any steps to remedy the conditions suggested by the resolution, and that the situation has been allowed to remain as it was before.

L. Sogge
S. H. Boyer
W. F. Braasch
J. T. Christison
H. M. Workman
C. B. Wright

President Sogge: You have heard this resolution. What do you wish to do with it?

Dr. Coventry: I move the report be accepted and placed on file.

The motion was regularly seconded, was put to a vote and carried.

President Sogge: We have an unusual honor today in having the President of the American Medical Association with us. He is a man that we are proud of because of his ability, and we are proud of him because he is President of the greatest medical organization in the world. I would like to have him stand up and speak to us just a few minutes, Dr. E. Starr Judd.

The audience arose and applauded.

Dr. E. Starr Judd (Rochester): One of my principal jobs now seems to be to try to learn something about organized medicine. I knew nothing about it a year ago, but I know very much more about it now.

One thing I have found out is that the Minnesota profession is really organized, better than any other state. That is largely due to the efforts of Dr. Meyerding and the Councilors. As you know, the state society, public health activities and all medical activities are under the control of Dr. Meyerding and the Councilors. I think that this is being recognized throughout the country. Very many of the state organizations are following our example in that respect. (Applause).

President Sogge: We will hear a resolution from the Secretary.

Secretary Meyerding: Last night Dr. Robbins of Winona presented a resolution that was referred to the Reference Committee but the Chairman is not here. I think that if I read it again you can take action.

This resolution is simply in conformity with one of the trends of public opinion. As you know, there is a great deal of interest now taken in the Indian. This is just a suggestion on the part of the House of Delegates, as I understand it, for the local society to cooperate with the public in studying Indian health. It reads as follows:

"Resolved, That the House of Delegates of the Minnesota State Medical Association go on record urging the component societies to incorporate in their public health educational programs a study of the health conditions of the Indian population, and its relation to the general public."

President Sogge: What do you want to do with this resolution?

Dr. E. S. Boleyn (Stillwater): I move that it be accepted and filed.

The motion was regularly seconded, was put to a vote and carried.

President Sogge: Amendment to the By-laws read last night.

Secretary Meyerding: Dr. Scofield introduced an amendment to Chapter V, Section I.

The By-laws say that we shall meet at two p. m. on the first day of the meeting. That caused a little trouble this year. We are simply striking out the words "two p. m." so we can set the hour.

Dr. H. M. Workman (Tracy): I move that it be adopted.

The motion was regularly seconded, was put to a vote and carried.

President Sogge: We will now continue with the report of Dr. Locken.

Dr. O. E. Locken (Crookston): Mr. President, when this Committee was appointed, and as we have drawn up this report, it was our opinion that there was nothing mandatory about what we recommended as far as the future policy of the Council was concerned, in carrying out these recommendations. It was our understanding that we were merely asked to make a survey of the sentiment of the organization and report back to you these recommendations.

We discussed this report very carefully all afternoon yesterday, and there was a great deal of discussion, pro and con. It seemed to me the whole thing was taken on the wrong track, that if we adopted this report it was mandatory on the Council to carry out every one of these recommendations. It is our idea that it is simply a matter of aid to the Council as an indication of what a disinterested group of five men thought about the policies of the organization, from a survey they made in an attempt to get the opinion of the entire organization. We do not wish to be in the position that we want to argue or defend any of these recommendations but merely express them. If any members of the House of Delegates have opinions contrary, I think it is proper that they get up and discuss those questions, so their opinion may be of help to the Council. I think if we have that understanding we will probably avoid a great deal of argument over some of these things and save some time, and make it possible for us to get to the clinics this afternoon. If that idea is correct, we can approach this report from that standpoint. I will read the summary of recommendations again.

President Sogge: Read them paragraph by paragraph.

Dr. Locken: If there is no dispute about them, it is not necessary to discuss each point.

"1. That the small individual county societies should combine, when feasible, with adjoining societies, to bring their membership up to approximately the average of 30 now existent in the other combined county societies."

President Sogge: I understand the Council took this matter up last night, and I would like to hear from Dr. Coventry what the recommendation was.

Dr. Coventry: We have discussed that in the Council off and on for the last year or so. There are two problems: One, amalgamating some of the smaller societies, and the other, redistricting the state as far as the Councilors are concerned.

A motion was made last evening and carried that the Council appoint a committee to survey the question of drawing the weaker societies in with the stronger ones, and also surveying the state as to redistricting, rearrangement, so far as Councilors are concerned. As I say, that motion was carried and a committee has been appointed. It seems to me, Mr. President, that will take care of the matter to the satisfaction of everybody.

President Sogge: Do you want to take action on the report from the Council, approve it, or anything to that effect?

Dr. J. R. Manley (Duluth): I move it be approved.

The motion was regularly seconded, was put to a vote and carried.

Dr. Locken: "2. That the Northern Minnesota Medical Association limit its annual meeting to a one-day program. That both Northern and Southern Societies meetings should be considered as one of the annual series of the county societies in their respective districts."

Dr. B. S. Adams (Hibbing): I think the Committee is absolutely right that one day is sufficient. I agree that there is a superfluity of medical meetings. However, the sentiment expressed to me is that the north would like to get together once in a while, and they want to continue the Northern Minnesota Medical Association and I presume in the southern part of the state they want to continue the Southern Minnesota Medical Association.

There is one thing that comes to my mind in connection with the meeting at Hibbing, and the same will apply more to meetings of the Northern Minnesota Association than to meetings of the Southern Minnesota Association, and that is the distances that we have to travel. We could have the meetings start early in the morning at Hibbing and finish up that night, but we have no sleeper trains coming into Hibbing. Anybody coming by way of Duluth will not get to Hibbing until ten forty-five. If they drive, they have to come up the day before, unless they want to do some night driving.

I am wondering if it wouldn't be better to have our meetings start, say, at one o'clock noon and on until eleven or twelve o'clock the next day. That will give those, that want to, a chance to drive. It will mean only one night away from home. Then on Saturday afternoon, after the meeting is over, we can give them a trip through the ore pits in an observation car, or they can go home. That is just a suggestion. We can work it out either way it seems advisable. We would like to get your advice.

President Sogge: Is there any further suggestion or discussion? I suggest that the resolution be sent to officers of the Northern and Southern Minnesota Medical Associations, because we can't take action on it, as far as I can see.

Dr. Boyer: Of course, this recommendation is not mandatory. It is simply given out to the Northern and

Southern Minnesota Medical Societies and, of necessity, to the component societies of the state organization, because, in the last analysis, it must be through the action of all of these bodies, as they see fit to consummate or follow out this recommendation. So it resolves itself, after all, into more or less of a local action. There is nothing that we can do.

President Sogge: Would you recommend that this go to the officers of the associations?

Dr. Boleyn: I so move.

The motion was regularly seconded.

President Sogge: It has been moved and seconded that this resolution be sent to the officers of the Northern Minnesota and Southern Minnesota Associations. All those in favor say "aye"; contrary "no." It is carried.

Dr. Locken: "3. That the present plan of administration of the State Association be continued."

President Sogge: What do I hear on that?

Dr. Boleyn: I move that it be adopted.

The motion was regularly seconded, was put to a vote and carried.

Dr. Locken: "4. That all arrangements for the annual meeting be handled by the state central office and by state committees with the exception of such matters of entertainment that the local host city is prepared to give. That income from commercial exhibits should go to the State Association and that it in turn should correspondingly assume expenses for the meeting."

President Sogge: What will you do with this recommendation?

Dr. M. S. Nelson (Granite Falls): I move it be adopted.

The motion was regularly seconded.

Dr. F. H. Magney (Duluth): I think before this is settled you should know our attitude in Duluth. We have had two State Association meetings since the practice of selling space was adopted by the State Association. We spent the money collected, first of all, to put on a good meeting at Duluth. The net proceeds we put in the Library Fund, and not one cent has been used for any other purpose. We are trying, if possible, to build up a library in Duluth that will be available to those in the northern end of the state. We are rather distant from the medical center here and we need a library. That is the only purpose we will use the money for.

I think before this is definitely settled it should perhaps be given a little further consideration, perhaps by a committee.

Dr. Locken: I took the liberty last evening, after our meeting, to go around and talk to some of the exhibitors to get their frank viewpoints on this. This isn't any reflection on the people of Minneapolis who have been responsible for the program, but there was definite dissatisfaction on the part of the exhibitors in the way their space has been handled. They have gone so far as to appoint a special committee of three members to handle affairs for them in the future, in their own defense. It is an indication that the exhibitors themselves feel that under the present system they are not being given an equal and fair handling in the space they require. We discussed the angle from the standpoint of the Association. I just wanted to offer that information.

Dr. J. P. McDowell (St. Cloud): Dr. Magney of Duluth has a good idea, but I will warn you that if any of the smaller towns want to put on the meeting in their town, they had better figure differently. They aren't going to get any library, but they are going to go down into their pockets, because we put on the Association meeting at St. Cloud a few years ago and I have had definite orders not to let it come up again because it costs too much money. I don't think myself that it was an advantage to the Association to meet in a small town. Don't ask for it unless you know where you are going to get off at.

President Sogge: Is there any further discussion.

Secretary Meyerding: For three or four years the Secretary has brought up the question of the commercial exhibits being handled by the central office. An exhibit of that type is like any other. You have to build up a clientele and make the acquaintance with those people. As Dr. Locken brought out, there are certain things they don't want, and they are more or less dissatisfied.

In the past few years we have had fairly good success. This is an excellent exhibit. It has been well run, in spite of the criticism the men make. They are a little crowded but it is the best thing that could be done. Last year at Duluth there were empty booths. The same thing happened at St. Paul.

The expense of the meeting is gradually increasing. The State Association has assumed more and more obligations. The cost has run from $1,200 a few years ago to $1,800 in Duluth. This year I was told to cut down, and we are having a two-day meeting, practically, as you know. If we are to have meetings in other cities we have to put on a different type of meeting, because we have to bring in outsiders for attraction, and allow each one from $200 to $300 for traveling expenses and one thing or another. It soon counts up when you have two or three or four speakers.

We would like to see the commercial exhibits in the hands of the state office, so that we could apply that expense to the state meeting and make a better meeting. Dr. Loomis is here. If you want to know about how to organize a commercial exhibit, he can tell you. This, I believe, is his first experience. As I said, he did a fine job. He had more than he could take care of.

Dr. E. A. Loomis (Minneapolis): Mr. President, the committee feels that this ought to be handled by the state. As you say, each year a new committee gets hold of it and you do not get organized. For instance, we took hold of this in February. I believe we could have had twice as many exhibits if we had taken hold of it before the first of the year because they all make up their budgets around the first of the year. When you send out the letters they write back and say, "We would have taken space if we had known about it the first of the year."

If you treat these fellows well and keep track of them from year to year, it will work much better. This year there is going to be a surplus and it goes to the Hennepin County Society. It might just as well go to the State. The dentists had ninety exhibitors at their meeting, and we have about thirty. We could have had at least fifty or sixty, but we have to get more space, if this thing keeps on growing. But the committee is strongly in favor of having it handled by the state, and the local men can do whatever the state wants them to do and help out.

President Sogge: There is one motion before the house that the report of the Committee be accepted. Is there any further discussion? All in favor of that motion say "aye"; contrary. The motion is carried.

Dr. Locken: "5. That the Public Contact Program be continued as in the past and special emphasis directed toward: (1) Medical leadership in County Public Health Associations. (2) Constant contact with the Public Health Nurses Association. (3) Coöperation with the Minnesota Editorial Association. (4) Coöperation with the University Medical School."

President Sogge: What do you want to do with this recommendation?

Upon motion regularly made and seconded the recommendation was adopted.

Dr. Locken: "6. That in the policy toward medical legislation the Association, appreciative of the present high standard of medical statutes, ask no further immediate favors from the legislature except to continue the principles now established; that expenditures for legislative activities be budgeted and audited by the Council."

Dr. M. S. Nelson (Granite Falls): Inasmuch as we don't know what is going to develop, it seems to me the Legislative Committee should not be handicapped as to expense or in any way more than they have been handicapped in the past. If this is going to be any handicap to the Legislative Committee, it seems to me it should either be referred to the Council or laid on the table.

Dr. Boyer: The Association and the Legislative Committee have not contemplated any legislation since the Basic Science Bill was passed, though we can never tell when some new type of legislation may become necessary. Something may come up that will require active work on the part of the Legislative Committee two years hence. The chances are there won't be any need for legislation; we hope not. But owing to the fact that such a possibility exists, we ought to take that into consideration.

As to the matter of activity on the part of the Legislative Committee, that must exist. This recommendation in no way touches upon that. There is legislation that will need to be combated. So far as that is concerned, this resolution does not interfere. But there is the possibility that it would interfere with what might prove to be a need for active legislation. Therefore, it seems to me that we ought to insist upon that resolution or that recommendation being altered.

Dr. Wright: In your discussion, Dr. Locken, I think you put in the phrase "as far as possible." I think that is an excellent phrase to put in.

Dr. Locken: That is in the main discussion of the thing. It was left out of the summary.

Dr. Wright: That leaves it quite clear, I think.

Secretary Meyerding: Do you want to add those words?

Dr. Locken: Yes, after "statutes."

President Sogge: Read that sentence again.

Dr. Locken: "That in the policy toward medical legislation the Association, appreciative of the present high standard of medical statutes, as far as possible, asks no further immediate favors from the legislature except to continue the principles now established."

President Sogge: With that correction, have you any objection?

Dr. Nelson: With that change, I move its adoption.

The motion was regularly seconded, was put to a vote and carried.

Dr. Locken: "7. That toward the problem of finance the Association restrict its expenditures in both legislative and educational activities to a level that can be met with the present income."

Secretary Meyerding: Dr. Locken, I wonder if you could take out the word "present" and say "its income." Somebody might want to give us some money and we couldn't spend it. I have a scheme now whereby we may raise some money.

Dr. Locken: It was simply an expression that we maintain our organization on the present level of dues.

President Sogge: Will you correct that?

Dr. Locken: "With its income."

President Sogge: You have heard this report. What do you wish to do with it?

Dr. Coventry: I move its adoption.

The motion was regularly seconded, was put to a vote and carried.

Dr. Locken: "8. That the policy of developing a reserve fund from savings in the management of the Association be continued. That steps be taken to give prizes and scholarships, both undergraduate and graduate, to the students of the medical school to indicate the interest of the Association in medical education."

Dr. Coventry: I move its adoption.

The motion was regularly seconded.

Dr. F. J. Savage (St. Paul): This fund amounts to about $24,000, and there isn't any definite unanimity of opinion among the members of the Council as to what sum this should reach before various expenditures might be made from it. In order to clarify this resolution I move the following amendment: After the word "that" in the second sentence insert the words "when deemed feasible," so it will read: "That, when deemed feasible, steps be taken to give prizes and scholarships," etc. That will make it less compulsory on the part of the Council, if they didn't want to put in this small amount at the present time, to defer the establishment of the precedent.

The amendment was regularly seconded.

Dr. Wright: I should like to say that this resolution came from Hennepin County, and it came because of the question of reserve, how large a reserve fund we should have. I don't want to urge the thing, but inasmuch as that is one of the things that was most anxiously wished for in this resolution, I should like to have some expression of opinion as to what we should aim for in the accumulation of a reserve fund. It may not be definite, but I think we ought to crystallize our opinion, to some extent, on what we want. If the House of Delegates has any opinion about it, it would be interesting to know. I wouldn't want to urge it upon the House of Delegates, but my personal feeling is that we should set our reserve fund fairly high. I believe all organizations are recognized by their financial responsibility, and I believe a reserve fund put at $50,000, $100,000, or something of that kind, might be a good thing to shoot at.

Dr. W. A. Fansler (Minneapolis): I am a member of this Committee but the conclusions do not necessarily represent the feeling of each individual as an individual. One reason we did not set a definite amount on this thing was the fact that we couldn't agree upon it; also, there was a great deal of disagreement on the questionnaire we sent out. I think there was more difference of opinion on that than almost anything else. But speaking for myself as a Delegate, I feel we should have a definite reserve fund that we can rely upon. If we had a reserve fund, perhaps, at the start of $50,000, it would mean a reserve of $20 per member, and that isn't much for protection. We spend that much each year for insurance against malpractice. I quite agree that if there was a definite amount, it would have some influence with the legislative bodies and with other people too. I should like to make an amendment that we set $50,000 as the goal for a reserve fund, for forwarding the interests of the State Medical Association. I merely mention that amount so we can get some discussion and see what the reaction is.

Dr. Coventry: The gist of the argument is this: The second part of that paragraph is the most essential thing, whether you are going to use any of this money for scholarships and so forth, as the Committee has suggested. It is my notion, personally, that we should take steps to establish some relationship between the Society and the graduate body and university by offering prizes or something of that kind. That does not have to be $1,000 or $500 or anything of that kind. You can start to take steps even before you get the total amount of reserve brought up.

Dr. McDowell: You and I have to go home and explain to a lot of fellows what we are going to do with $50,000. They say, "We are paying too much dues." They are the kickers. You and I know that we ought to have some money in reserve in order to make a showing against our opponents in the legislature or against insurance companies or anybody else that want to buck us. But we have to take back to those fellows at home something definite as to what we have this reserve for.

Another thing is that you can use this money for scholarships and hope to get it back, which you probably will, but I just happened to talk with a man who runs a business college up at Fargo, whose son is studying medicine in Chicago. He was prouder than a peacock because his son had a key which he earned doing some research work at the University of Chicago, and he seemed prouder than if it had been a scholarship. I don't think that cost them very much money. You could give prizes that way and it would not cost you much. When you talk to the fellows at home about giving out money to help somebody else through school they holler about "who helped me through school?" They say, "We have too many doctors."

Dr. W. F. Braasch (Rochester): We might reassure the constituents that within the last few years very little has been added to the reserve fund. Almost every dollar of income has been necessary for expenditures. I do think that if we could have a reserve fund, without mentioning any exact figure, but a considerable amount, it would be an indication of power and we could use it for a whole lot of emergencies. I should like to see the day when we had an income from which our Secretary might be paid, or some special officer, or could take care of some special thing that would arise. In other words, it would certainly be for the best interests of the Association if we had a large fund back of us.

Dr. Wright: I wonder if that couldn't be amended by including the word "endowment" or "donation." Sometimes societies get money that way. I think it would be a good thing to make a statement about reserve even though they feel it should not be increased. I think it would be perfectly all right, if the Committee so feels, to say "we do not feel the reserve should be increased at the present time." What do you think of that?

Dr. McDowell: As I said before, I think we ought to have this reserve. If we can make some definite use of it, for research work or paying our officers, or something of that kind, we will ultimately cut down the dues, but we should have some idea of what we are going to use it for, for the fellows at home.

Dr. Ivar Sivertsen (Minneapolis): I might tell Dr. McDowell to bring home to his local society, and I think the balance of the members can bring it home to their societies, the fact that the chiropractors and osteopaths and other cults are paying from $200 to $300 a year during the legislative years for a fund to fight bills. If they can afford to pay that much money, it seems to me we can afford to pay $15 a year to the State Society for the help they give us in bringing about the legislation we need.

Dr. Workman: This increase in our Reserve Fund is due to the interest on the money. It isn't taken from our dues. It is the interest that is increasing our fund now.

President Sogge: We have an amendment to the original motion. That is the thing before the house.

Dr. Coventry: May I ask for a reading of the original resolution?

Dr. Locken: "That the policy of developing a reserve fund from savings in the management of the Association be continued. That steps be taken to give prizes and scholarships, both undergraduate and graduate, to the students of the medical school to indicate the interest of the Association in medical education."

The amendment was simply in the second sentence: "That, *when deemed feasible,* steps be taken to give prizes and scholarships."

President Sogge: You have heard the amendment. What do you wish to do with it? It was moved and seconded that the recommendation be so amended. All in favor of the amendment say "aye"; contrary. The "ayes" have it. Now the original motion.

Dr. Coventry: Who deems it feasible?

Dr. Locken: Who made the amendment? Let him explain what he had in mind.

President Sogge: Dr. Savage made the amendment.

Dr. Savage: This carries with it the fact that the Council is the only body with power to spend that money, unless it could be spent by orders of the House of Delegates. So this amendment means when the Council deems it feasible. It does not make it quite as mandatory as it reads at present.

President Sogge: We are on the original motion that we accept this recommendation. Is there any further discussion? All in favor of that signify by saying "aye"; contrary. The motion is carried.

Dr. Locken: "9. That the medical journal Minnesota Medicine continue its present policy of serving as an organ for scientific articles and association activities. The subject of economics should be left to the Editorial Committee."

President Sogge: You have heard this recommendation.

Dr. Braasch: I think that last conclusion is unfortunate in one way. While we are all proud of Minnesota Medicine and we are proud of the scientific standards they have maintained, we have a medical journal which is second to none, nevertheless, I think many of the members of the Association and I am sure most of the Delegates here are interested in subjects other than scientific medicine. I refer particularly to the subject of medical economics. There seems to be some confusion in regard to that. Medical economics does not necessarily mean financial aggrandizement as a recent editorial in Minnesota Medicine would suggest. It refers to a broader aspect, namely state medicine, insurance, medical insurance, contract practice. Many sociological changes in the practice of medicine are creeping in and developing rapidly. The only way the medical profession can insure its present enviable status is by concerted action in solving these intelligent questions. How can we solve these questions until we know about them? The only medium we have at our command is our medical journal. I think the pages ought to be open to the subject of medical economics and we ought to encourage, in fact we ought to pass a resolution, that the Board of Editors develop this to a greater extent. I believe as the resolution reads it would not do that. I, therefore, would like to amend the resolution as follows: It is the opinion of the House of Delegates that we commend the Board of Editors in their present policy toward the financial development of the Journal, that the pages be open to even a greater extent to the discussion and intelligent information concerning medical economics.

The motion was regularly seconded.

Dr. N. O. Pearce (Minneapolis): It seems to me the question of medical economics is one that should have more attention in the Journal. It should have more attention from the State Association. I am sorry more of you were not here last night when we presented statistics on the present situation in medical practice. I think it is very important that the State Medical Association at this time should set up an Economics Committee, a committee which will make a study of medical practice, medical conditions in the state, make an analysis of what the doctors in the state are earning and what they are going to have to compete with in the future.

There is a committee in existence known as the Committee of Fifty which was supported by funds from somewhere, I don't know where, possibly insurance companies. Anyway, this committee of fifty or sixty men, most of which are doctors but only a few representing organized medicine, is making a study of the high cost of medical care. They are not making this study from the standpoint of the earnings of the physician, particularly, but with the idea of presenting facts which are concerned with the high cost to the public for care when they are sick. We don't know what the final recommendation of this committee will be. They are not a practicing medical group. There are a great many doctors on that committee. Many of them are teachers or sociologists, and we have representation from our American Medical Association, not a large representation. I think Dr. West and others are really concerned with what recommendations may come out of this committee. Certainly, as has been said so many times, just around the corner there is a scheme, there is a plan for some sort of compulsory health insurance. This is a world-wide movement. It has the endorsement of various world-wide organizations. It has taken place and has become established in many of the leading countries of the world.

It seems to me that this Association here in Minnesota, regardless of what the American Medical Association is doing, regardless of what anyone else is doing, should prepare among ourselves for a close analysis of the report of the Committee of Fifty and all other conditions that have to do with the practice of medicine from an economic standpoint. We should have a committee with enough funds appropriated by the Council for the necessary clerical help to gather together all of the information. We should be making our own studies of these various types of panel medicine that are going on in European countries, so we may be prepared in the next year or two, when a move is on foot, to meet that move in an intelligent manner.

I don't know whether it would be appropriate to have another amendment asking for the appointment of such a committee. If it is, I should like to make such a motion.

Dr. Locken: The suggestion we made here was made because we first obtained the sentiment of the Editorial Committee. We found in preparing this report that it was very necessary to guide our suggestions carefully, because we found that the Council, the Legislative Committee and the Public Health Committee were rather sensitive to anything that might be inferred as a question of criticism of their present policies. So purely as a matter of courtesy to the Editorial Committee of Minnesota Medicine, which we feel has been doing a very fine piece of work, knowing their reaction, we felt we should leave that to their judgment rather than ask them to change their methods. I think in the manner of expression of the view of Dr. Braasch and Dr. Pearce, it would be a very fine thing if we carry out both of those suggestions and have such a committee.

President Sogge: Is there any objection to Dr. Pearce's amendment? I will entertain such an amendment.

Dr. Pearce: I move, Mr. President, that the House of Delegates authorize the Council of the State Medical Association to appoint a committee to be known as the Economics Committee, composed of five members, this committee to make a study of economic conditions (I won't describe it further than that) and that the Council be authorized to appropriate a reasonable sum of money for clerical and other help necessary to carry out the work of the committee.

President Sogge: Dr. Braasch, do you accept that amendment?

Dr. Braasch: I think that motion is out of order. I made an amendment to the motion for the adoption of this resolution.

President Sogge: We thought of getting it into one motion.

Dr. Braasch: I don't see how you can do that. This is a committee that has to do with medical economics, and I am making an amendment to the resolution.

President Sogge: I think the point is well taken. Let us have the amendment. Dr. Braasch, will you state it again?

Dr. Braasch: What was the last half of your resolution?

Dr. Locken: "The subject of economics should be left to the Editorial Committee."

Dr. Braasch: I move that it be amended to read: they be requested to open the pages of the Journal even more than they have in the past to the discussion and to the publication of articles dealing with medical economics.

President Sogge: That amendment was seconded. Is there any discussion? All in favor signify by saying "aye"; contrary. The motion is carried.

Let us consider Dr. Pearce's motion that a committee be appointed by the Council, known as the Economics Committee, and that the Council should be empowered to appropriate enough money for clerical work. Is there a second?

The motion was regularly seconded.

President Sogge: Is there any discussion? All in favor signify by saying "aye"; contrary. The motion is carried.

Dr. Wright: I should like to rise to a point of information. There has been a good deal of discussion about the House of Delegates appropriating money. I would like to know whether the House of Delegates has any right to appropriate a cent or not, without consent of the Council. The reason I ask that is this: The Trustees of the American Medical Association are the only ones who can appropriate money in the American Medical Association. The House of Delegates can't appropriate a cent without the consent of the Trustees. A bank can't appropriate money without the consent of the board of directors. The Council is our board of directors. Therefore, under our articles of incorporation, I don't believe we can possibly legally appropriate funds without the consent of the Council. I should like to know if there has been a legal question on that point.

Dr. Coventry: I would like to ask the speaker if the House has appropriated money. This motion was that the Council have the power to do it.

Dr. Wright: I am not questioning that. I think it should be understood that the House of Delegates have no power to appropriate funds without the permission and consent of the Council.

President Sogge: We probably are exceeding our power to a certain extent, but what we wanted to know is if the House of Delegates approve the action if the Council so does.

Dr. Locken: "10. That the question of combining the offices of Secretary and Treasurer be decided on the recommendation of the Coucil."

It is understood that if that change is made it is necessary to have an amendment to our Constitution.

President Sogge: Do I hear a motion on that?

Upon motion regularly made and seconded, the recommendation was adopted.

Dr. Locken: "11. That the present group of attorneys of the Association be retained."

Dr. Scofield: I move the adoption.

Dr. Coventry: The present group is Oppenheimer, Dickson, Hodgson Brown and Donnelly. It may not be the policy of the Councilors to employ these people. I don't know personally whether we should act upon such a resolution at this time. We may have some good reason in the Council why we want to change this. If the House of Delegates order us to do so, we are rather up against it. There may be good reason why we would want to change.

President Sogge: There is a motion that we accept this recommendation. You can vote it down or accept it as you want. Is there any further discussion?

Dr. M. W. Smith (Red Wing): Is that a recommendation? The Councilors can do as they please.

Dr. Coventry: The Council does not like to do things against the wishes of the House of Delegates.

Dr. McDowell: It seems to me that if we are going to have a Council of intelligent men and they are going to run this business for us, we ought to let them do much as the board of directors in a bank would do. We ought to give them a little power to change the attorneys if they want to. I think we ought to vote that down.

Dr. Locken: That was in the report merely because certain members of the Council asked the Committee, in the first place, to consider that recommendation. It is perfectly satisfactory to us to have it removed. We only have it in the report because we were asked to consider it.

Dr. Magney: How are the attorneys paid, on the basis of work they do?

President Sogge: Yes, the work they do.

Dr. Magney: Instead of specifying that we retain the present group of attorneys, say that we have attorneys representing us.

President Sogge: You have heard the motion. Is there any further discussion?

Dr. Smith: I move it be laid on the table.

The motion was regularly seconded.

President Sogge: All in favor of the motion to lay on the table say "aye"; contrary. The motion is carried.

I feel that this House of Delegates ought to give this Committee a vote of thanks for all the work they have done. They have surely worked well, and they have studied the questions. I feel we should incorporate in the record a vote of thanks to the Committee.

Dr. O. J. Hagen (Moorhead). I so move.

The motion was regularly seconded, was put to a vote and carried.

President Sogge: Election of officers. Who do you want for President for the ensuing year?

Dr. W. C. Carroll (St. Paul): I think there are very few societies in the country that can boast of so many prominent men as the Minnesota State Medical Association. Among them we have one of international reputation, a prolific writer in his chosen field. He has been president of the county society, the Southern Minnesota Medical Society, and chairman of his section in the American Medical Association. He has been a Delegate here on numerous occasions and is at present on the Council. I am sure that the mention of his name will be sufficient to place him in the office which has held so many prominent men.

I nominate Dr. Melvin S. Henderson of Rochester. (Applause.)

President Sogge: Are there any further nominations?

Dr. A. G. Schulze (St. Paul): I move that the nominations be closed and that the Secretary cast the unanimous ballot of this House of Delegates for Dr. Henderson of Rochester as our President-Elect.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary hereby casts the unanimous vote of the House of Delegates for Dr. Melvin S. Henderson as President for the ensuing year.

President Sogge: Who do you want for First Vice President?

Dr. Pearce: I would like to nominate Dr. Bert Adams of Hibbing.

The nomination was regularly seconded.

President Sogge: Are there any other nominations?

Dr. Coventry: I move that the nominations be closed and that the Secretary be instructed to cast a ballot for Dr. Adams.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: The Secretary hereby casts the unanimous vote of the House of Delegates for Dr. Adams as First Vice President.

President Sogge: Second Vice President.

Dr. A. W. Adson (Rochester): I should like to nominate Dr. A. E. Hedback, Minneapolis, who is General Chairman of the Committee on Scientific Assembly as Second Vice President.

The motion was regularly seconded.

President Sogge: Are there any other nominations?

Dr. Adson: I move that the nominations be closed and the Secretary be instructed to cast the ballot.

The motion was regularly seconded, was put to a vote and carried.

Secretary Meyerding: I hereby cast the unanimous vote of the House of Delegates for Dr. Hedback as Second Vice President.

President Sogge: What about the Secretary?

Dr. Pearce: I move that the President cast the ballot for the present incumbent, Dr. Meyerding.

The motion was regularly seconded, was put to a vote and carried.

President Sogge: The President casts the ballot for Dr. Meyerding as Secretary for the ensuing year.

Who do you want for Treasurer?

Dr. W. A. Fansler (Minneapolis): We have a man that I think would make a good Treasurer. He has been on the Council for a number of years. He is familiar with the workings of the organization. I would like to nominate Dr. W. H. Condit, Minneapolis.

The nomination was regularly seconded.

Upon motion regularly made and seconded, the nominations were closed and the Secretary was instructed to cast the ballot for Dr. Condit.

President Sogge: We will instruct the Secretary to cast the ballot.

Secretary Meyerding: The Secretary casts the unanimous ballot of the House of Delegates for Dr. Condit as Treasurer for the ensuing year.

We want to announce that this is the largest House of Delegates meeting. Our records show there are 59 Delegates present out of 62. There are only three societies not represented. That is the largest we have ever had.

The total registration at this time is a little over 550, and we expect that it will be over 900 at the close of this meeting.

President Sogge: Councilors. Dr. Henderson is now President-Elect. We will have to have a Councilor from the First District.

Dr. Adson: The Rochester delegation would like to put in the name of Dr. H. Z. Giffin as candidate for the Council for the ensuing year.

PRESIDENT SOGGE: Are there any further nominations from the First District?

DR. BRAASCH: I move the nominations be closed and the Secretary cast the ballot.

The motion was regularly seconded, was put to a vote and carried.

SECRETARY MEYERDING: I hereby cast the unanimous ballot of the House of Delegates for Dr. H. Z. Giffin as Councilor for the First District.

PRESIDENT SOGGE: Third District. Dr. Workman is the present Councilor.

DR. BOLEYN: I nominate Dr. Workman.

Upon motion regularly made and seconded, nominations were closed and the Secretary was instructed to cast the ballot.

SECRETARY MEYERDING: I hereby cast the unanimous ballot of the House of Delegates for Dr. Workman as Councilor for the Third District.

PRESIDENT SOGGE: The next is the Fifth District. Dr. Savage is the present Councilor.

DR. BOLEYN: I nominate Dr. Savage as Councilor for the Fifth District.

DR. BRAASCH: I take pleasure in seconding that nomination.

PRESIDENT SOGGE: Are there any further nominations?

Upon motion regularly made and seconded, nominations were closed and the Secretary was instructed to cast the ballot.

SECRETARY MEYERDING: I hereby cast the unanimous ballot of the House of Delegates for Dr. Savage as Councilor for the Fifth District.

PRESIDENT SOGGE: Seventh District. W. W. Will, Bertha.

DR. PEARCE: I nominate Dr. Will.

DR. MCDOWELL: I move the nominations be closed and the Secretary cast the ballot.

The motion was regularly seconded, was put to a vote and carried.

SECRETARY MEYERDING: I hereby cast the unanimous ballot of the House of Delegates for Dr. Will as Councilor for the Seventh District.

PRESIDENT SOGGE: Delegates to the American Medical Association. The Council recommended the nomination of Dr. C. B. Wright as Delegate and Dr. J. T. Christison as Alternate. Are there any other nominations?

DR. SCOFIELD: I move that the nominations of the Council be accepted and the Secretary cast the ballot.

The motion was regularly seconded, was put to a vote and carried.

SECRETARY MEYERDING: The Secretary casts the unanimous ballot for Dr. C. B. Wright as Delegate and Dr. J. T. Christison as Alternate to the American Medicine Association.

PRESIDENT SOGGE: Meeting place for next year.

DR. CARROLL: I have letters from the Mayor and the Secretary of the St. Paul Association inviting the State Association to meet in St. Paul in 1932.

DR. BRAASCH: I take great pleasure in seconding that invitation. It was the intention of those of us from Rochester to invite this Association to meet there next year. However, we would defer to the wishes of St. Paul, knowing that they have started their campaign. However, we hope this Association will see fit to come our way in 1933.

PRESIDENT SOGGE: You have heard this invitation to meet in St. Paul next year. Are there any other invitations?

DR. KLAVENESS: I move it be accepted.

The motion was regularly seconded.

PRESIDENT SOGGE: You have heard the motion. All in favor of meeting in St. Paul next year say "aye"; contrary. The motion is carried.

SECRETARY MEYERDING: Last year the House of Delegates passed a resolution, or at least it was its opinion that we do not have our House of Delegates session during the scientific meetings. We have tried to do this. We had the House of Delegates meet last night. There has been criticism on the meeting. We would like to do what the Delegates want. If you will discuss that a minute, we would appreciate it very much. What time of the day do you want to meet and at what hour? Would you like to meet during the scientific sessions or go back to the old way, meeting on Monday afternoon at one-thirty or two o'clock? We had medical economics in the evenings, and the next day the scientific program commenced. If you will make some expression so we can work upon it, we will appreciate it very much.

DR. ROBBINS: I suggested last year that we meet the day before the scientific meeting so we could finish this session in the afternoon instead of the evening, and cover all of it.

PRESIDENT SOGGE: I will appoint the following committee to present the President-Elect to the House of Delegates: Dr. E. S. Boleyn, Stillwater; Dr. M. S. Nelson, Granite Falls; Dr. S. A. Slater, Worthington.

Let us have your expression on the subject brought up by the Secretary.

DR. ADAMS: The meeting last night was ideal. We don't have to break up a whole day. I was able to do some of my work yesterday morning. I don't see how that can be improved upon.

SECRETARY MEYERDING: We wanted to have it on Sunday but somebody said that wasn't good form, somebody might criticize us for working on Sunday. We discontinued the idea of Sunday, and Monday night seemed the best plan under the circumstances.

DR. WRIGHT: Certainly from the standpoint of attendance and interest, I think this has been the most interesting meeting we have had in the House of Delegates. I think that matter should be left to the Council. As far as Sunday is concerned, I am not a particularly scrupulous religious adherent or churchgoer, but I feel it is the only day a man has to give to his family, and I feel that to hold a meeting of this kind on Sunday would be a little bit out of step.

The audience rose and applauded as President-Elect Henderson was escorted to the platform.

PRESIDENT-ELECT HENDERSON: Mr. President and Members of the House of Delegates: Needless to say, this is a proud moment for me. I heard rumors that it might happen so I thought I had better get out for a few minutes and give you a chance to say what you wanted to say about me.

A thing of this kind comes to a man only once in a lifetime, and I wonder whether it means that I have passed the noon of my surgical career and am tripping down the other side. I know that while I am very proud, I am also very humble. I realize that it is a tribute not only to myself but to my good friends with whom I have worked for many years, and I take pride in the fact that I am to shed a little light on them in a small way.

The State Association, of course, has grown. Its activities have varied, and the traditions and all that are back of the Association are wonderful. Minnesota has been in the vanguard of progress in medical work and scientific work in the United States in the past, and now they are holding that position, advancing along the lines of economic medicine.

I don't want to take any more of your time. There is much I could say and much I would like to say. All that I can say is that I am very proud and will do all I can to fulfill this high office and be of service. (Applause.)

President Sogge: Let us go back to where we were, the time of holding the meeting next year. Let us have a motion.

Dr. B. I. Saliterman (Janesville): I move that the time be left to the Council.

The motion was regularly seconded, was put to a vote and carried.

President Sogge: We have some resolutions.

We want to offer a resolution of thanks to the Hennepin County Medical Society for its fine work in entertaining the Association, to the Nicollet Hotel and its management, to the Minneapolis Civic and Commerce Association, to the Minneapolis Journal, Tribune and Star.

President Sogge: You have heard these resolutions.

Dr. Adson: I move they be adopted and that a committee be appointed to draft the resolutions.

The motion was regularly seconded, was put to a vote and carried.

President Sogge: I will appoint as the Resolutions Committee: O. J. Hagen, Chairman, Moorhead; W. A. Piper, Mountain Lake; C. L. Scofield, Benson.

I will ask Dr. Braasch and Dr. Boyer to present the newly elected officers to the Association tomorrow morning at ten o'clock.

I will have to ask your pardon for having rushed the business so fast but I felt it was absolutely necessary because we wanted to get to the clinics.

Is there any new business, or anything anybody wants to bring before the body?

I want to say I feel very grateful to you for the splendid way in which you have transacted business here this afternoon. A motion to adjourn is in order.

Upon motion regularly made and seconded the meeting adjourned at one-fifteen o'clock.

SCIENTIFIC PROGRAM

The scientific program was presented as published in the April, 1931, number of Minnesota Medicine with the following changes:

Dr. Arthur E. Smith, Minneapolis, presented a paper Wednesday morning entitled "Impairment of Vision Following Head Injuries."

Dr. C. A. Neumann was not present to present his paper on "Fractures of the Wrist."

Wednesday afternoon Dr. S. A. Slater, Worthington, made the announcement that the prize offered by the Southern Minnesota Medical Association for the best scientific exhibit displayed at the State meeting had been awarded to Dr. W. P. Herbst, Minneapolis, and honorable mention given to Dr. R. K. Ghormley, Rochester. The medal was formally presented August 24, 1931 at the annual meeting of the Southern Minnesota Medical Association.

The papers presented will for the most part be published in subsequent issues of Minnesota Medicine.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

Vol. XIV OCTOBER, 1931 No. 10

CARDIOLOGY AND THE GENERAL PRACTITIONER*

Drew Luten, M.D.
Saint Louis, Missouri

ABNORMAL circulatory phenomena occupy rather a large part of the general practitioner's time. In some cases they are his chief concern; in many more they arrest his attention even though his primary interest may be otherwise directed. For some of them he finds ready explanation. Others present problems of greater difficulty. He is sometimes confused by apparent contradictions. A man rejected for life insurance lives long in good health while another recently accepted without question dies suddenly of coronary occlusion. A patient with signs of serious heart disease stands an emergency operation well, while another with little evidence of circulatory disorder suffers collapse. A woman yet in her twenties dies of rheumatic heart disease while another in her fifties who has had well defined mitral disease for forty years sails for Europe on a pleasure trip. The practitioner finds bradycardia in one patient with brain tumor, in another with heart block. Extreme tachycardia accompanied by auricular fibrillation he encounters in patients with thyrotoxicosis who later exhibit no abnormal cardiac signs, and also in patients about to die of heart failure. He observes regularity of heart action without acceleration and without murmurs in patients on their death beds and he sees men doing hard work who exhibit systolic murmurs and whose heart beats rapidly. In one case certain cardiac signs present no special problem, in another grave questions await their proper interpretation.

In explaining such apparent contradictions certain physiological principles must be kept in mind. Not only is the circulation vital to all tissues of the body but it is also the chief means of correlating the activities of the various parts. Only through it do the several organs function as members of a single body. In health the demands upon the circulatory system are constantly changing and in order to meet these demands it responds easily and quickly to many and varied influences. This lability of the circulation is especially valuable in disease where an observed phenomenon is often the resultant of many factors. Thus it is that pathological processes widely different in character may be accompanied by circulatory phenomena quite similar in kind, while different signs may result from disorders closely related in origin.

In every instance circulatory signs and symptoms must be considered in their relationship to other aspects of the case. Abnormal circulatory manifestations cannot be regarded as independent or as isolated phenomena. This being true, therapeutic procedures in most instances should not be directed primarily against them. It is rather to the underlying pathological process responsible for the observed effect that direct consideration should be given. Exceptions occur. In some instances the primary process cannot be discovered. Secondary disease processes in general may themselves be attended with danger, with pain, or with annoyance. Under any of these circumstances they must be directly treated unless the cause may be readily removed or controlled. But such exceptions should not divert us from general principles nor distort our perspective. It is the purpose of this paper to apply these fundamental conceptions to certain abnormalities of the circulation commonly encountered in general practice, particularly to certain abnormalities of heart rate and of heart rhythm.

---

*Read before the Minnesota State Medical Association, Minneapolis, May 6, 1931.

Simple Tachycardia.—Simple tachycardia in many instances represents an adjustment of the circulation to pathological processes and should not receive special therapeutic consideration. Therapy in such cases obviously should be directed not toward slowing the heart, but toward mitigating the cause of tachycardia. Mere slowing may indeed upon occasion be harmful. The initiation of direct measures to lessen the heart rate in hemorrhage, in pneumonia, in fright or in exophthalmic goiter would appear as illogical as the taking of similar means to slow the respiratory rate in the same circumstances; as illogical as trying to slow it after exercise.

The assumption is widespread that tachycardia itself is attended by serious danger if long continued; that the heart cannot long withstand rapid beating. This conception has received an emphasis which appears to be unwarranted. The heart is physiologically adapted to rapid action. Increase in rate *per se* does impose added burden, but a normal heart bears the burden well. Furthermore, compensatory adjustments usually supervene. Even a diseased heart usually appears to suffer little impairment of function from tachycardia of considerable extent, provided the muscle is activated in normal fashion, *i.e.*, provided the tachycardia originates at the normal pacemaker. In a diseased heart obviously the danger of fatigue from tachycardia may be enhanced, but even in such cases compensatory adjustments in stroke output and in vascular tension usually relieve the heart of this added danger. In many instances, indeed, the accelerated action itself appears to be a compensatory adjustment, tachycardia representing the effect of circulatory impairment, not its cause. Surely the chief indication of therapy in such cases should be the protection of the heart from further danger, not an unphysiological adaption to injury already received.

Not only is it inadvisable, in many instances, to slow the rate in simple tachycardia, but in adults it is rarely possible by therapeutic means to do so. In therapeutic dosage digitalis rarely, if ever, in adults causes slowing of consequence by direct action upon the cardio—inhibitory apparatus. The physician who pushes digitalis in such an attempt, even if slowing be desirable, subjects his patient to the serious danger of digitalis intoxication.

Abnormal Rhythms.—Abnormalities of cardiac mechanism in general have been given a prominence altogether out of proportion to their importance. In most instances the principles of treatment and the management of the patient are not influenced by their presence or absence. Certain exceptions to this rule will be noted below. One might say that cardiology after emerging from the age of murmurs and before reaching the light of the functional era was for a decade or more confused in the dark period of abnormal rhythms. But it is emerging from the dark age and is beginning to lay aside some of the terror inspired by the mythology of abnormal rhythms.

Upon occasion, it is true, a patient's heart behaves as if under the spell of an occult influence, and all effort to exorcise the demon appears to be of no avail. Such visitations are comparatively rare. Better understanding has taught us that, as a rule, abnormal rhythms are not fearsome, and upon occasion are indeed quite friendly. In most instances not only is the general plan of treatment unaffected by the presence of such a disorder, but even the disordered rhythm itself demands no special therapy. It is properly ignored. Not infrequently, on the other hand, the occurrence of an abnormal rhythm, far from being inspired by an evil spirit to confuse us, proves but a friendly warning, a sign to point away from danger into the way of better treatment. Instead of trying to do away with the signal, we should, rather, accept its generous warning and lend our effort to overcome the danger it helps us recognize. After we have succeeded in doing this, the portent often vanishes only to reappear, perhaps, as danger is approached again. It thus becomes a useful gauge of proper therapy.

Auricular Fibrillation.—These considerations apply with special force to auricular fibrillation. Most patients with this disorder need treatment. So do most patients with fever and most patients with abnormal blood pictures. But usually it is better therapy to direct treatment against the cause of the fever or of the blood dyscrasia than to try blindly to change the temperature chart or the blood count by any means available. And even though the thoughtful physician gives much attention to these charts, finding them invaluable as guides, he still remembers that the object of his therapy is not a certain level of temperature or of blood, but a certain therapeutic result indicated by the chart he studies.

And so it is with auricular fibrillation. The great addition to our knowledge afforded by study of auricular fiibrillation and its graphic registration has so impressed medical practice that this disorder itself too often assumes chief place in therapy. Although exceptions occur, in the vast majority of cases it is not the disordered mechanism that needs treatment, but the disease process producing the abnormal rhythm. Treatment of this differs in different cases, the course of the auricular fibrillation being merely incidental. Rarely should it receive special treatment. The following examples are illustrative:

A patient after operation for toxic adenoma develops auricular fibrillation with tachycardia. The presence of the fibrillation alters the general aspect of the case very little, but fortunately it does make the picture of the "crisis" more distinct, thus defining more clearly the indication for iodine or other measures to meet it. Cause and effect must not be confused. The primary consideration in treatment must be the crisis, not some particular manifestation of the toxic effect.

A patient with rheumatism receives a specific vaccine, after which rise of temperature and auricular fibrillation develop. The auricular fibrillation is an incident in the reaction to excessive vaccine therapy, not the cause of it. Under appropriate treatment the reaction subsides, the abnormal rhythm disappearing along with other manifestations of it.

A patient with heart failure and auricular fibrillation receives digitalis. So do patients with heart failure without auricular fibrillation. Treatment is the same in both cases, the auricular fibrillation constituting no indication for special therapy. The presence of fibrillation in such cases may furnish a valuable guide to digitalis dosage, the heart rate usually being an index, to some extent at least, of the efficacy of the drug. But the indication for digitalis in heart failure, let it be remembered, is not modified by the presence or absence of fibrillation. Auricular fibrillation *per se* is not an indication for digitalis.

During the course of pneumonia the occurrence of auricular fibrillation is not unusual. Recent study of a large series of cases over a two year period shows that the administration of digitalis was accompanied by increased mortality in those patients with auricular fibrillation as well as in those with normal mechanism. Since fibrillation in such cases must be regarded as an expression of toxemia, this result would appear to demand no special explanation.

Although as a rule auricular fibrillation constitutes no indication for special therapy, exceptions occur. Great prominence has been given to the notion that the extreme tachycardia which sometimes results from this disorder may upon occasion be the source of great danger apart from other aspects of the case and demand special treatment not otherwise indicated. It would appear that this conception practically limits such special therapy to quinidine, and confines its employment under such circumstances to cases without heart failure. For surely in cases of this sort associated with heart failure digitalis is indicated irrespectively of the fibrillation and irrespectively of the tachycardia, and could not, therefore, be regarded as a special measure. Quinidine, furthermore, as a rule, is contraindicated in heart failure. In those cases of auricular fibrillation with excessive tachycardia unassociated with heart failure, on the other hand, due to toxemia or other cause, digitalis rarely is very effective, and may, indeed, be a source of danger. If this conception of the life-saving effect of quinidine is indeed correct, the occasion for its employment confronts the practitioner but rarely, and it, too, would appear to be not devoid of danger.

More commonly, cases of auricular fibrillation in which special therapy is indicated appear to fall into the other category, *i.e.*, that group of cases in which the disorder constitutes not an element of danger but a source of annoyance. In cases of this group in which the fibrillation cannot readily be eliminated by removal of the cause, and which present no contraindication to the administration of quinidine, this drug upon occasion may be employed with good results. It must be remembered, however, that cases of auricular fibrillation falling into this group constitute but a small proportion of total cases.

Extra Systoles.—In general, what has been said regarding auricular fibrillation applies also to extra systoles. In most instances patients exhibiting such interruptions to regular heart action should be treated precisely as they would be did the heart beat rhythmically. If the primary cause can be discovered, it should receive principal, if not entire, consideration. Toxemia must be combatted, infection removed, nervousness allayed. Tobacco may have to be eliminated, gastro-intestinal disorders corrected. Many patients are unaware of their occurrence. It would sometimes be better if this ignorance extended also to their medical advisors. But these disorders, too, upon occasion are helpful. They may suggest greater detail in examination or in history taking, or may demand closer consideration to therapeutic measures already in use.

Like auricular fibrillation they may demand special treatment. Occasion for this arises not from any danger inherent in the arrhythmia, but from the annoyance produced by it. A rather large proportion of those who are aware of extra systoles are greatly perturbed or annoyed by them. Strychnine is the drug of choice. In doses of 1/60 to 1/40 of a grain three times a day it stops the occurrence of extra systoles in many instances. The addition of small doses of quinine and of one of the barbituric acid derivatives frequently appears to be of value. Quinidine is often useful.

Heart Block.—Heart block is an expression of myocardial injury, an index of damage. In those cases in which the myocardial lesion results from infection or other acute process, removal of the cause usually results in restoration of function to the conducting tissue. The heart needs no special treatment, nor is special treatment often effective in removing the block. The patient needs careful management in an illness of such severity whether the conduction of impulses from auricle to ventricle is accomplished or not.

In chronic cases the prospect for recovery of conduction is poor with or without special treatment. The pathological process responsible for the block is rarely modified enough to restore conductivity. It is usually an index of grave injury to the myocardium and on that account rather than because of the bradycardia it lends gravity to prognosis. In these cases, too, the abnormal rhythm usually should be ignored in treatment. Tinkering is often dangerous.

The presence of Adams-Stokes attacks alters the situation. The danger here lies not simply in the failure of a-v conduction. The critical nature of the seizures demands the employment of measures offering any prospect of relief. Barium chloride in the interval, epinepherine during the attack, have been productive of good results.

Paroxysmal Tachycardia. — Paroxysms of tachycardia more commonly than other abnormalities of rhythm may demand special therapeutic measures. From their very nature, however, such paroxysms, whether auricular fibrillation, auricular flutter, auricular or ventricular tachycardia usually end spontaneously. Except in those cases in which the ventricular muscle parts are activated in abnormal sequence (ventricular tachycardia), there is rarely evidence of deficient circulation even with attacks of relatively long duration. And even in these cases the prognosis, as a general rule, is good so far as the particular attack is concerned. Necessity for special treatment, therefore, in paroxysms of tachycardia is the exception rather than the rule. These attacks may occur in patients without other cardiac abnormality, while upon occasion the cardiac lesion is so grave that life or death may depend upon the measures employed. The danger of doing too much is often as great as that of doing too little. The necessity of "doing something" may not be as urgent as the obligation of doing nothing harmful. Under such circumstances surely the thoughtful physician, whether general practitioner or specialist, would choose the company of those who tread with fear rather than rush into ill considered therapy. The indication for treatment in the vast majority of cases consists not in any danger from the attack but in the discomfort and perturbation produced by it. The patient should be put at rest, and sedatives or opiates administered as indicated. Not the least of quieting measures may be the reassurance which in most instances can be truthfully given. Differentiation, while frequently accomplished at the bedside, may be impossible without instrumental means. Pressure over the carotid sheath may be not only an important procedure in differential diagnosis but in paroxysms of regular auricular type it may be effective also in stopping the attack.

After a reasonable time if the attack does not end spontaneously, and if carotid pressure has been ineffective, special measures may be employed. The precise treatment may depend upon the type of paroxysm, and upon the circumstances of its occurrence. Extended discussion of the use of quinidine and of digitalis in the various types of tachycardia occurring in paroxysms would require space beyond the limit of this paper. In many instances these drugs control or stop such disorders. Upon other occasions it is unnecessary or unwise to use them. Rarely can the employment of either be regarded as an emergency measure.

In these disorders of rate and of rhythm, as well as in cardiac disorders generally, a complete history and a general examination are of more value in determining treatment than examination of the heart; in the examination, physical signs are of more value than graphic records. The following case well illustrates this rule, even though it constitutes an exaggerated example. A few days after operation a patient suddenly was seized with a paroxysm of tachycardia. The electrocardiogram showed ventricular complexes occurring regularly, but no one who examined the record felt confident of a precise electrocardiographic diagnosis. A second record, obtained a few hours later, in places showed ventricular complexes occurring regularly, in other places irregularly. Digitalis was ordered, and after this quinidine. The paroxysm soon ended. At no time had evidences of circulatory insufficiency been apparent. Later it was discovered that for twenty years the patient had been subject to frequent attacks of rapid heart action, in only a few of which had a physician been called. The attacks had always ended spontaneously, sedatives having been administered upon only a few occasions.

SUMMARY

Simple tachycardia frequently represents a compensatory adjustment of the circulation. When primary, compensatory adjustments usually follow it. Direct measures to slow the rate are rarely indicated and are rarely successful when tried.

Abnormal rhythms in the vast majority of instances require no special therapeutic measures. Some of them frequently are valuable hints in diagnosis and useful guides in therapy. They call for general examination and treatment, not merely for examination of the heart and cardiac drugs. The abnormal rhythm itself is rarely dangerous; it is frequently annoying. Special treatment, therefore, when indicated, is rarely an emergency measure. In most instances a complete history is more important than a complete cardiac examination.

3720 Washington Boulevard

PRENATAL CARE AND THE CAREFUL CONDUCT OF DELIVERY*

Martin C. Bergheim, M.D.
Hawley, Minnesota

In 1923 I read a paper before this association entitled: "Obstetrics and the General Practitioner." In that paper I emphasized the value of prenatal care. I brought out the fact that only 15 per cent of my obstetrical cases were reporting for such care. Furthermore, I stressed the point that it was the duty of every physician, doing obstetrical work, to educate the public that it might see the great value of prenatal care for the expectant mother and her child.

In 1929, in discussing a paper presented at the annual meeting of the State Association, I mentioned the fact that a careful review of my obstetrical cases showed that those coming in for prenatal care had in six years increased from 15 per cent to 83 per cent. And today I find that during the two years that have elapsed since May, 1929, 90 per cent of all obstetrical cases delivered by me have appeared once or oftener for prenatal care; and over 50 per cent of these reported before the end of the fourth month. I have found, therefore, (1) that it is possible for the doctor in general practice, and in the rural community, to do prenatal work; (2) that it is possible by persistant and conscientious effort, to teach the mothers the value of prenatal care; (3) I have found that expectant mothers can be taught to come regularly for prenatal care, even from the very early months of gestation.

When expectant mothers know that the doctor is willing to give them care during pregnancy, they will come from the remotest corners. Through social workers, county nurses, through newspapers and publications of the State Board of Health, and the Department of Labor, at Washington, the public of today has gradually come to know a great deal about prenatal care and its important bearing on the health and life of both the mother and her infant. Expectant mothers will go to the doctor who will give them such care. The doctor who is not willing to give prenatal care, has no right to expect to be called to the obstetrical case at the time of delivery.

I charge a reasonable price for my obstetrical cases, but make no extra charge for prenatal care given at the office. The cost, therefore, to the patient, is the same whether she comes in for prenatal care or not. It is a little difficult to teach these patients not to come in on Sundays and holidays, and after office hours at night. At one time I used to make a small charge for each call, if the patient came on "the day of rest," or at night. But now I make that a part of "that second mile," and smile in so doing.

Careful records must be kept of all obstetrical cases. I have a record card, six by eight inches, folded in the middle, printed especially for my obstetrical cases. Any size card, however, will do. The first prenatal call includes a complete physical examination as well as a past history of the patient. This first call will require twenty or thirty minutes. Subsequent calls will require only five or ten minutes of the doctor's time. And, if necessary, the well trained nurse can do most of the routine examination at these subsequent calls.

At the time of the first call careful pelvic measurements are made. The heart, lungs, kidneys, and the breasts are examined. The blood pressure is recorded. The mouth and throat are examined for possible foci of infection. These days, especially in primiparas, it is important to note the general nutrition, and to examine the lungs carefully, because of the high incidence of tuberculosis among young women. The general health of the patient must be considered. Malnourishment must be corrected. Many young women of today have highly sensitive nervous systems from various causes, and consequently we find among them many nervous and mental problems when they become pregnant. These neurotics are very often exceedingly hard to manage. They constitute one of the difficult, as well as one of the unpleasant problems, that a doctor has to deal with in doing prenatal work. They are worried, they did not want to become pregnant in many cases, they are afraid of pregnancy. The big majority of cases of vomiting of pregnancy are neurotic in origin and very seldom toxic. Often these patients vomit incessantly and clamor for the doctor to terminate the pregnancy. At times they must be hospitalized and isolated. Usually, however, they ultimately respond to the proper treatment. And one must always be alert to distinguish between the neurotic and the toxic types of vomiting.

---

*Presented before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

During the first seven months, if everything is normal, the patient need not report more than once a month. But during the eight and ninth months, she must report every two weeks. If any abnormality develops, the patient must report more frequently, and if a grave condition threatens, the patient is seen at her home or she may be hospitalized according to the gravity of the condition.

Even the very busy physician can afford to spend five or ten minutes a month or twice a month, to give the necessary prenatal care to his obstetrical cases. As a routine at the regular visits, the kidneys, the heart, and the blood pressure are examined. The general condition of the patient is observed, and any conditions, like "heart-burn," constipation, headache, puffiness of the eye-lids and feet, varicose veins of the legs and feet, are observed and corrected. Anything that points to beginning toxemia is noted and "nipped in the bud." Thus serious toxemias can be prevented. Toward the end of pregnancy the position of the child is noted. In general, the object of prenatal care is to bring the mother and the child safe and sound up to the time of delivery, and with as little discomfort, worry, and grief to the mother as possible. And when this has been accomplished, the whole battle of child bearing is more than half over. When labor sets in, the doctor knows his case, and the mother and her family know the doctor. Under these circumstances, the mother does not go into labor frightened and uncertain as to the outcome.

What are the results of prenatal care? Prenatal care saves the lives of mothers and infants. In the United States at large, there has been little, if any, reduction in the maternal mortality rate during the past fifteen or twenty years. If such a reduction comes, it must come through proper education of the public, proper prenatal care, and proper care of the mother during the delivery. There are many doctors in Minnesota who are training their patients to report for prenatal care, and by such care the maternal as well as the infant mortality rate, and the morbidity rate, are being cut down materially.

In California in 1920 the maternal mortality rate per thousand total births (including stillbirths) was 6.8. As a result of prenatal care in that State the maternal rate has been cut to 5.1 per thousand total births, a saving of almost two hundred mothers in that state alone.

According to the department of health in New York City the death rate among pregnant women who had the proper prenatal care was only one half as high as it was among those who had no such care.

In Kentucky, the prenatal clinic of the Louisville City Hospital has published some interesting statistics on the value of prenatal care. During a five year period ending in 1928 there were 3,217 deliveries. Of these, 2,061 attended the prenatal clinic, while 1,156 had received no prenatal care. In the first group there were only six deaths, or 2.91 deaths per thousand. Of the 1,156 who received no prenatal care twenty-six died, a rate of 22.4 per thousand deliveries. Over 3 per cent of those with no prenatal care developed eclampsia and ten died, while only a little over 0.5 per cent of those with proper prenatal care developed eclampsia and none of these ended fatally.

A report of the demonstration made by the Commonwealth Fund, shows the great value of preventive medicine in the field of prenatal care. The figures taken from four typical American communities, (Fargo, North Dakota; Rutherford County, Tennessee; Marion County, Oregon; Clark County, Georgia), show that the "Maternal death rate, still-births, and infant mortality under one month of age, were double in the group that received no prenatal care."

I take the liberty of quoting from an article by Doctor Polak of Brooklyn. He says, "In Brooklyn in the district influenced by our prenatal Clinic not only has the mortality in eclampsia been lowered, but severe eclampsia is an exception." . . . "This we attribute to continuous prenatal propaganda." This same authority gives the maternal death rate per thousand in a series of 12,066 cases, which were divided among five different hospitals and teaching units. All of these patients received prenatal care and good care during delivery. The average maternal death rate for the whole series was 3.5 per thousand, while the rate for the city at large was twice that high.

If we who do obstetrical work can cut the maternal mortality rate down from 6.2 which it is in the United States today, to 3.5 as has been done in these teaching clinics in Brooklyn, we would by so doing save annually seven thousand mothers.

True we cannot reduce the death rate to nil, because of the difficult cases that will develop, and because of miscarriages, abortions, poor health, improper hygiene, etc., but we can cut the death rate in two. What has been of such great benefit to individual communities will be of equally great benefit to the State of Minnesota and to the country at large.

Originally I was supposed to speak on prenatal care only. But, I added a coda to my subject, namely: "The Conduct of Labor." This was done because I wish to bring out one or two points in this connection.

In the rural districts, as well as in some homes in the city, the environment is often very unfavorable for the proper conduct of labor. The doctor and his nurse may do all in their power to carry out good technic during the delivery, but the hygienic environment as well as the type of intelligence and the conduct of the patient and the attendants may be decidedly against them. But, however unfavorable the environment one thing is certain, and that is this: If at the time of delivery one resorts to external abdominal examinations and rectal examinations only, one is not introducing any of the infectious material that surrounds the patient, into the parturient canal. I always keep this in mind that the vaginal secretions are almost always sterile, and, furthermore, that the vaginal flow is always outward. The only thing that goes in is the examining finger of the doctor. And if during delivery he makes no vaginal examinations he can rest assured that he has not introduced any infectious organisms.

The doctor in general practice must care for cases of virulent infection of every sort, and no matter how careful he may be, virulent organisms cannot be completely scrubbed from the hands. Sterile gloves should be carefully put on, rectal examinations should be made, and vaginal examinations resorted to only when absolutely necessary.

In an exhaustive article by Holmes, Mussey, and Adair, we read this statement regarding puerperal infection: "The source of infection in connection with child bearing may be considered as endogenous and exogenous. Endogenous infection may be largely ignored. Practically all puerperal infection may be regarded as contact infection and therefore as contagion."

I take the liberty of quoting from an article by Doctor Litzenberg: "The two principal causes of maternal mortality are infection and eclampsia, both almost wholly preventable." . . . "Over eleven thousand deaths each year are due to these causes." . . . "By application of the simple requirements of prenatal care and asepsis at delivery, thousands of these women need not have died."

In teaching the importance of prenatal work and the careful conduct of labor where shall we start? The public is willing to learn, but how can the public properly learn unless there is someone to teach? The responsibility rests first and foremost with the physicians. In any phase of medicine where the physicians are in the forefront and where they are doing their full duty the state and federal governments will not step in. It is when we fail in our vigilance that outside factors are ready to enter. It is possible for the doctor to do conscientious prenatal work whether he be located in the city or in the rural community. It is possible by persistant effort to teach the public the value of prenatal care. And it is possible to train the pregnant mothers to come and to come early in pregnancy. The doctor must learn first in order that he may teach the public. And the doctor must be willing to spend both time and energy in teaching the public.

The instruction at the medical schools, and the internships must teach the medical students the importance of the careful conduct of delivery under every circumstance. It is impossible for most medical schools to give each and every student the practical training in delivering obstetrical cases that he should have. Such practical training should for the most part come during the internship. An obstetrical service during ones internship where one is required to care for and deliver a large number of normal cases as well as a certain number of abnormal cases should be required. The medical schools are giving splendid courses in obstetrics, yet most of the real practical work must come during the hospital service. Not so many years ago when I took my intern work I spent four months on the obstetrical service in a large hospital. Three hundred and eighty-six patients were delivered during those months, many of them abnormal cases. I delivered any number of normal cases, but it was only after I got into private practice, when I had no staff member at my side to guide me, that I applied a pair of forceps for the first time, or did a version, or a breech delivery. In my first forceps case after I began private practice nature was very kind and let both the mother and the child live, but I trembled and "sweat blood" during the operation, and worried for days afterwards.

I have no large series of cases to draw from, and I have very little right as yet to quote any figures or draw any conclusions. I have, however, records of 1,342 cases. Among these I have had only one maternal death, and this was due to influenza contracted before delivery. There have been no cesarean sections; only one mutilation operation—this a case of an anencephelon. I have had only four cases of eclampsia, each developing only one or two convulsions, and I have never had to do a therapeutic abortion. I have, indeed, been fortunate. "My lines have fallen in pleasant places." But, if I have had a low mortality rate heretofore, in this small series, that is no guarantee that I will not lose a mother tomorrow, or next month, or two or three mothers by a year from now. But this I hope, that if I *do* lose any mothers it will not be because of my negligence.

In conclusion let me deviate from the scientific for a moment: A wayfaring man came upon three men working in a stone quarry. He said to the first one, "What are you doing?" The answer was, "I am cutting stone." He said to the second one, "What are you doing?" The answer was, "I am earning five dollars a day." He asked the third, "And what are you doing?" and this man answered, "I am building a cathedral." As true followers of Hippocrates we as practicing physicians are ever building "cathedrals" in all our work. But, we are especially building "cathedrals" when we save the lives of infants; and when we preserve the precious lives and the health of the mothers who are to care for these infants.

BIBLIOGRAPHY

1. Child Health Demonstration Committee: Child Health in Marion County, Oregon. Commonwealth Fund, New York. Bull. 2:3, (Feb.), 1927.
2. Child Health Demonstration Committee. A Survey of Public Health Work in North Dakota. Commonwealth Fund, New York. Bull. 5 (June), 1927.
3. Child Health Demonstration Committee. Serving the Child in Fargo. Commonwealth Fund, New York. Bull. 9 (Nov.), 1928.
4. Bergheim, M. C.: Obstetrics and the general practitioner. Minn. Med. 7:92 (Jan.), 1924.
5. Henderson, A. J.: Obstetrical experience of a rural physician. Minn. Med. 12:604 (Oct.), 1929.
6. La Vake, R. T.: The rectal examination and the concealed second stage of labor. Minn. Med. 13:111 (Feb.), 1930.
7. Brodhead, George L.: Approaching motherhood. Paul B. Hoeber, New York. Third Edition, April, 1930.
8. West, Mrs. Max: Prenatal care. Washington Printing Office, 1924.
9. Schuman, Edward A.: Practical aspects of antenatal hygiene. Jour. Am. Med. Assn. 75:1518, (Nov. 27), 1920.
10. Beck, Alfred C.: End results of prenatal care. Jour. Am. Med. Assn., 77:457 (Aug. 6), 1921.
11. Sellers, Thomas B.: Prepartum care. Jour. Am. Med. Assn., 79:2110 (Dec. 16), 1922.
12. Feldman, W. M.: Prenatal hygiene and problems of maternity and child welfare. Jour. Am. Med. Assn., 80:432 (Feb. 10), 1923.
13. Foreign Letters, London. The role of prenatal consultation in the crusade against infant mortality. Jour. Am. Med. Assn., 84:689 (Feb. 28), 1925.
14. Rowland, J. M. H.: Reduction of mortality and Morbidity in child. Jour. Am. Med. Assn., 87:2158 (Dec. 25), 1926.
15. Foreign Letters, London. The prevention of maternal mortality. Jour Am. Med. Assn., 89:1977 (Dec. 3), 1927.
16. Baker, S. Josephine: Maternal mortality in the United States. Jour. Am. Med. Assn., 89:2016 (Dec. 10), 1927.
17. Foreign Letters. The cleanliness of pregnant women and its importance for the puerperium. Jour. Am. Med. Assn., 88:528 (Feb. 12), 1927.
18. Brown, A.: Prenatal care in California. Jour. Am. Med. Assn., 88:1447 (Apr. 30), 1927.
19. Foreign Letters, Germany. Organization of the care of pregnant women in the city of Berlin. Jour. Am. Med. Assn., 91:2077 (Dec. 29), 1928.
20. Foreign Letters, Paris. Efforts to reduce infant mortality. Jour. Am. Med. Assn., 90:993 (Mar. 24), 1928.
21. Emerson, G. S.: Preventive medicine. (Abst.) Jour. Am. Med. Assn., 90:1189 (Apr. 14), 1928.
22. Foreign Letters, Italy. Premature separation of the normal placenta. Jour. Am. Med. Assn., 90:1643 (May 19), 1928.
23. Foreign Letters, London. The combating maternity mortality. Jour. Am. Med. Assn., 90:1801 (June 2), 1928.
24. Foreign Letters, Turkey. Infant mortality. Jour. Am. Med. Assn., 91:410 (Aug. 11), 1928.
25. Current Comment. Infant mortality rate for 1927. Jour. Am. Med. Assn., 91:502 (Aug. 18), 1928.

26. Foreign Letters, London. Maternity and child welfare. Jour. Am. Med Assn., 91:655 (Sept. 1), 1928.
27. Bailey, H.: Long labor and maternal deaths. Jour. Am. Med. Assn., 91:1137 (Oct. 13), 1928.
28. Litzenberg, Jennings C.: Obstetrics and gynecology in public health program. Jour. Am. Med. Assn., 91:1587 (Nov. 24), 1928.
29. Polak, John Osborn: Puerperal morbidity and mortality. Jour. Am. Med. Assn., 93:1436 (Nov. 9), 1929.
30. Holmes, R. W., Mussey, R. D., Adair, F. L.: Factors and causes of maternal mortality. Jour. Am. Med. Assn., 93:1440 (Nov. 9), 1929.
31. Medical News. Maternal mortality declines in 1927. Jour. Am. Med. Assn., 92:323 (Jan. 26), 1929.
32. Matthews, Harvey B. and Bryant, Louise Stevens: Pregnancy and tuberculosis. Jour. Am. Med. Assn., 95:1707 (Dec. 6), 1930.
33. Stracham, G. I.: Preventive aspect of obstetrics. Jour. Am. Med. Assn., 94:1178 (Apr. 12), 1930.
34. Foreign Letters. Aid for expectant mothers. Jour. Am. Med. Assn., 94:2008 (June 21), 1930.

PAUPERIZATION OF THE PATIENT

A few alarmed observers never tire of shouting that there is a skeleton in the closets of hospitals and clinics. It is called, they aver, Pauperization of the Patient, and is responsible on the one hand for undermining the morale of the sick one, and on the other for using its bony fingers to keep dollars from the pockets of deserving doctors. A study recently published by the Chicago Institute of Medicine brings the fearsome creature out into the open. Trained investigators, guided by a committee of physicians and a committee on economic and social factors, including representatives of the University of Chicago, the School of Social Service Administration, Northwestern University, the Julius Rosenwald Fund, the United Charities and the Council of Social Agencies, gathered elaborate data concerning more than five hundred consecutive hospital and clinic patients in six large medical institutions of Chicago. After the facts of earnings, rent, unemployment, size of family, presence or absence of automobile and the like, were brought together and weighed, it was found that a little less than 4 per cent of these patients might have paid more than they did for their medical care, at least for a time. But on the other hand five times that number—or 20 per cent of the whole lot—had paid out more, in the opinion of the investigators, than they could afford. They had gone without food to buy medicine, or had sunk into debt in order to pay amounts completely disproportionate to their resources. More than half of the whole group of patients had employed private physicians previously for their illness, and had resorted to free or part-pay services only when their money was used up. To determine the ability of a family to pay for medical service, the authors conclude, is a complex matter in which consideration must be given to many factors, including income, living standards, expense of previous illnesses and probable expense and outcome of the present one. —Editorial, *The Survey*, Feb. 15, 1931.

RECURRING PREECLAMPTIC TOXEMIA: ITS CLINICAL SIGNIFICANCE*

Robert D. Mussey, M.D.
Rochester, Minnesota

PREECLAMPTIC toxemia occurs in approximately 3 per cent of pregnancies which are carried to the third trimester. In reporting the triple recurrence of eclampsia in the same patient, Laun, in 1928, reviewed the literature and stated that the percentage of recurrence of eclampsia is between 1.5 and 8 per cent. He expressed the belief that the higher rate is more nearly correct and quoted Bund who noted an increased incidence of recurrence of eclampsia in subsequent pregnancies. Schmechel reported 238 cases of eclampsia in 27,430 deliveries. Of these 238 patients, thirty-seven died primarily, two died during the course of the next year (cause of death unknown) and forty-one were not heard from. One hundred fifty-eight patients answered Schmechel's questionnaire. Eighty-three of these experienced subsequent pregnancies: thirty-five (42 per cent) without symptoms of eclampsia; thirty-three (40 per cent) with symptoms of eclampsia (five interruptions of pregnancy), and fifteen (18 per cent) with recurrent eclampsia. He quoted Zangmeister as stating that of forty-one patients with eclampsia who became pregnant later the eclampsia recurred in 12 per cent.

Gibberd reported fifty-one cases in which the patients were observed through at least two pregnancies at Guy's Hospital, the first pregnancy being associated with albuminuria. Four patients had chronic nephritis prior to the first pregnancy. The remaining forty-seven cases did not show evidence of nephritis early in the first pregnancy. In six of these cases in which the albuminuria was noted nine weeks (average time) prior to termination of pregnancy, chronic nephritis developed. In twenty-seven of the remaining forty-one cases in which recovery apparently was complete, the pregnancy terminated within three weeks of onset of albuminuria, and in fourteen cases later than three weeks afterward. In eleven (40 per cent) of the first group f cases and ten (70 per cent) of the second group, there was recurrence of toxemia in the second pregnancy. Gibberd expressed the belief that this indicates that residual injury is more common when the toxemia has been present for a longer period prior to delivery. He also quoted James Young who stated that in 31 per cent of cases of albuminuria of pregnancy the condition recurred. In a group of 225 patients with toxemia observed through two pregnancies, Kellogg noted that 80 per cent had recurrence of toxemia and elevated blood pressure.

The toxin causing preeclamptic toxemia produces more or less widespread arteriolar and capillary injury throughout the body, affecting chiefly the liver, kidneys, brain and heart. The liver, which appears to be almost invariably involved, has remarkable regenerative ability, so that patients recovering from the disease rarely, if ever, present symptoms of injury to the liver. The kidneys, which are perhaps less frequently and often less severely involved, may not recover so completely. In fact evidence indicates that a number of cases of chronic nephritis are a direct sequence of preeclamptic or eclamptic toxemia.

Caldwell and Lyle reported an incidence of 8 per cent of chronic nephritis after eclampsia. Gibson found that in five of fourteen cases of eclampsia and in two of twelve cases of preeclampsia chronic nephritis developed. Gibson quoted Koblanck as stating that 6.5 per cent of women had chronic nephritis as a result of toxemia of pregnancy. Harris, in a study of examinations of patients one year postpartum, found that three of twenty-seven patients with eclampsia and 60 per cent of patients with preeclampsia showed definite signs of chronic nephritis. Peckham observed that 12.2 per cent of primiparæ and 39.3 per cent of multiparæ had nephritis following preeclamptic toxemia. In his cases nephritis did not subsequently develop when the systolic blood pressure remained less than 170. When the systolic blood pressure was between 170 and 200, 15 per cent of the patients had nephritis, and when it was more than 200, 48 per cent had nephritis. Mussey, Keith and Rockwood reported fifty-seven cases in which chronic nephritis developed as a result of preeclamptic toxemia. After observing 225 patients with preeclamptic toxemia through two pregnancies sixty-eight of whom were observed through more than two pregnancies, Kellogg stated, "We have a general impression from this group that, on the whole, as progressive pregnancies occur, the patients tend to get worse earlier in pregnancy and that we are able to demonstrate with added pregnancies more and more established nephritic patients."

---

*From the Section on Obstetrics, The Mayo Clinic. Read before the Minnesota State Medical Association, Minneapolis, May 5, 1931.

Albuminuria, hypertension and edema are often apparent earlier in pregnancy in cases of chronic nephritis than in cases of preeclamptic toxemia, usually before the seventh month. The specific gravity of the urine is fixed or low and tests of renal function often disclose retention of nitrogen and phenolsulphonephthalein. Usually blood pressure is elevated and often there are changes in the ocular fundi resulting from previous acute nephritis. However, as Gibberd, and Kellogg have indicated, the injury to the kidney may be so slight that it is revealed only by the test of subsequent pregnancy.

I have observed ninety-seven patients with toxemia of the later months of pregnancy in a series of 2,906 deliveries, an incidence of 3.3 per cent. Ten patients had eclamptic convulsions, eighty had preeclamptic toxemia and seven had a history or evidence of nephritis prior to the first pregnancy. Thirty-five (36 per cent) of the ninety-seven patients were observed through at least one ensuing pregnancy; two of these patients had preëxisting chronic nephritis. One patient with eclampsia and thirteen with preeclampsia did not have toxemia in subsequent pregnancies. Nineteen (57 per cent) of the thirty-three patients with toxemia who had not had chronic nephritis experienced recurring toxemia in an ensuing pregnancy. Four of these, one of whom had eclamptic convulsions in the first pregnancy, had no evidence of persisting arterial or renal injury. Seven patients manifested suggestive but not conclusive evidence of chronic nephritis. Eight patients with recurring toxemia, none of whom gave a history or clinical or laboratory evidence of nephritis prior to the first pregnancy, showed definite evidence of a more or less severe grade of chronic nephritis, following one or more pregnancies in which there was preeclampsia; one of these patients had eclamptic convulsions in the second pregnancy. In one case of preeclamptic toxemia, in which the patient did not become pregnant again chronic nephritis developed.

None of the ten patients with eclampsia had prenatal care. Two became pregnant subsequently; one patient had recurring toxemia and one did not. Three patients died and two subsequently had chronic nephritis.

Of the ninety-seven patients with toxemia 26.8 per cent had more or less adequate prenatal care; 17.5 per cent had entirely inadequate care and 55 per cent had no care. Patients with recurring toxemia were about equally divided in the type of prenatal care.

Preeclamptic toxemia occurs during pregnancy as a primary disease of women without preëxisting evidence of disease of the liver or kidneys. During the course of preeclamptic toxemia many women manifest clinical evidence of acute renal injury. The types of injury may be grouped as follows:

(1) If the injury is slight, perhaps merely a circulatory disturbance, or slight degenerative changes, recovery may be complete; (2) if the injury is more severe it may become permanent, although so slight that it may not be detected by any test of renal function now available except the test of subsequent pregnancy, and (3) the injury may be sufficient to produce unquestioned chronic nephritis.

When patients who have had preeclamptic toxemia become pregnant again it will be observed that a large proportion (60 per cent in this report) will have symptoms of toxemia. Certain patients classified in group 1 will escape and others, although they may have completely recovered from the previous toxemia, will have recurrent toxemia as a result of the same unknown toxin which produced it the first time.

A larger proportion of patients in group 2 will be affected either by recurring toxemia or by symptoms arising from previously undetected chronic nephritis. Patients of groups 1 and 2 would probably fall in the group Stander has termed "low reserve kidney."

Most of the patients of group 3 will have symptoms, due in part to toxic factors and in part to the chronic nephritis caused by the previous toxemia.

Injury to blood vessels may occur even when there is no apparent renal injury. Following preeclamptic toxemia patients have been observed through several pregnancies with progressive arteriosclerosis and hypertension, but without demonstrable evidence of renal insufficiency.

COMMENT

A small proportion of pregnant women, possibly 3 or 4 per cent, have preeclamptic toxemia primarily. Evidence seems to indicate that a majority of the patients who have had preeclamptic toxemia will have similar symptoms in ensuing pregnancies. If this is so, it is evident that an attack of preeclamptic toxemia frequently causes some impairment of the patient's resistance to a subsequent attack, which may be due to: (1) lowering of physiologic defense; (2) sensitization of the tissues to certain foreign proteins, perhaps elaborated in the placenta or fetus or both, or (3) actual injury to tissues caused by the toxin. Little information is available concerning lowered physiologic protection or foreign protein sensitization following preeclamptic toxemia. Of the tissues or organs affected by this disease, the kidney is the organ which gives the most common clinical indication of the course and severity of the disease. When permanent injury follows an attack of preeclamptic toxemia the kidneys appear to bear the brunt of this injury.

SUMMARY AND CONCLUSIONS

Most patients who have had preeclamptic toxemia will have recurring toxemia if they become pregnant subsequently.

Recurring toxemia is probably due to the same factor or factors producing the original attack and affecting: (1) patients who have completely recovered from a previous attack; (2) patients with undetected residual renal or arterial injury subsequent to a previous attack, and (3) patients with definite chronic nephritis which existed before or developed subsequent to the previous preeclamptic toxemia.

In this series none of the patients with eclamptic convulsions had prenatal care and most of those with preeclamptic toxemia either had no care or the care was inadequate. In most instances a physician was not consulted until symptoms of toxemia were evident to the patient or relatives.

Adequate prenatal care for all pregnant women should lower the incidence of toxemia. Such care is possible only if the expectant mother consults her physician early in pregnancy and cooperates fully in carrying out his instructions.

The frequency of recurrence of preeclamptic toxemia and the relative frequency of residual chronic nephritis following this disease emphasizes the need for postnatal care and the importance of keeping certain patients under observation beyond the usual six or eight weeks, if need be, for six or more months after delivery. A woman who has had preeclamptic toxemia should not become pregnant again until a year or more has elapsed, and only after examination and estimation of the functional ability of the kidney to stand the strain of pregnancy.

BIBLIOGRAPHY

1. Caldwell, W. E. and Lyle, W. G.: The blood chemistry in normal and abnormal pregnancy. Am. Jour. Obst. and Gynec., 2:17-34 (July), 1921.
2. Gibberd, G. F.: Relation between recurrent albuminuria, chronic nephritis, and toxemia of pregnancy. Brit. Med. Jour., 1:674-677 (April 13), 1929.
3. Gibson, H. K.: The sequelae and later aspect of the toxic albuminurias of pregnancy. Surg., Gynec., and Obst., 32:513-518 (June), 1921.
4. Harris, J. W.: The after-effects of the late toxemias of pregnancy. Bull. Johns Hopkins Hosp., 35:103-107 (April), 1924.
5. Kellogg, F. S.: Observations on toxemic nephritic group cases with special reference to classification. Am. Jour. Obst. and Gynec., 21:275-279 (Feb.), 1931.
6. Laun: Dreimaliges Auftreten der Eklampsie bei derselben Patientin. Zentralbl. f. Gynäk., 52:1792-1796 (July), 1928.
7. Peckham, C. H.: Chronic nephritis following eclampsia. Bull. Johns Hopkins Hosp., 45:176-188 (Sept.) 1929.
8. Rockwood, Reed, Mussey, R. D. and Keith, N. M.: A clinical study of nephritis in cases of pregnancy. Surg., Gynec., and Obst., 42:342-350 (March), 1926.
9. Schmechel, Arthur: Über die rezidivierende Eklampsie. Zentralbl. f. Gynäk., 53:2405-2409 (Sept.), 1929.
10. Stander, H. J.: The toxemias of pregnancy. Medicine monographs. Baltimore, Williams and Wilkins Co., 1929, 161 pp.
11. Young, James: The prognosis and treatment of eclampsia and albuminuria, with special reference to the risk of recurrence in subsequent pregnancies. Proc. Roy. Soc. Med., Sec. Obst. and Gynec., 22:314-320, 1929.

ACCIDENTS OF LABOR*

James R. Manley, M.D.
Duluth, Minnesota

THE successful practice of obstetrics requires a reasonable knowledge of several different specialties. The pregnant woman may suffer from any disease during her nine months term. She could be classified as a medical case until labor sets in, as she may have to be treated for vomiting, thyroid disfunction, various infectious diseases, heart trouble and the different kidney and toxemic conditions found at this time.

At soon as the child is born she becomes primarily a surgical case and must be treated and handled according to the principles of surgery; she may suffer from surgical shock, hemorrhage, tissue injury and infection.

The subject, Accidents of Labor, which has been assigned to me is therefore a surgical subject and the treatment must be along surgical lines.

The accidents of labor include most of the complications which are sudden and dramatic in their onset, and which may result disastrously if proper treatment is not promptly administered, and which, indirectly, account for most of the maternal deaths.

Time is too limited to take up all of the accidents of labor in detail, and so this discussion will be limited to a few of the most common and important ones.

A laceration of the birth canal is the most common accident. Lacerations of the vaginal walls and perineum are mentioned in passing only to emphasize the necessity of careful aseptic surgical repair. This will militate strongly against infection as a virulent streptococcic infection may enter through lacerations.

RECTAL TEAR

A third degree laceration into the rectum, however, is a serious accident, and on its proper treatment depends the patient's future comfort and possibly her life. It must be repaired accurately and at once if the patient's condition will allow.

To make a good repair a nearly bloodless field must be obtained. If the placenta has separated and can be expressed, this should be done, a hypodermic of ergot given, and a large laparotomy sponge packed in the vagina to control seepage from above. Active bleeding points should be tied and the situation surveyed. If the placenta has not separated I give l.c. of pituitrin insert the pack as above alongside the cord and proceed with the repair while the placenta is undergoing separation. Someone must watch the uterus to detect accumulation of blood within its cavity. If active uterine bleeding occurs, the repair work is halted, the pack removed and another attempt made to express the placenta; if this fails and uterine bleeding persists a manual removal of the placenta is done, ergot given and the repair continued. Too much time must not be consumed as the patient may have a degree of shock from her delivery and a short anesthesia is desirable.

Mercurochrome is swabbed over the raw surface and two Allis forceps are placed at the edges of the rectal tear at the mucocutaneous border, the bowel straightened out by traction and the rent repaired by intestinal sutures of No. 0 chromic gut. Starting at the top a continuous suture is placed, endeavoring not to go through the mucous membrane of the rectum but only through the muscular coat. After this suture is tied at the lower end the next step is to secure the sphincter ani. Usually one end is protruding and the other end is retracted deep in its bed, because the rupture usually occurs in the lateral part of the muscle. The end of the muscle is secured by inserting an Allis forceps deep in the bed and pulling the muscle into view. It can be easily recognized because the fibers run transversely to the rectum. The severed ends are united with two or three interrupted No. 0 chromic sutures.

The next step is to bury the line of suture in the bowel by a continuous Lembert suture as is done in intestinal anastomosis. After this is done the tear in the vaginal floor is repaired with chromic No. 1 catgut and the perineal body reconstructed by wide sutures bringing the separated tissues together in the midline. The skin sutures are of silkworm extending widely to the sides into the perineal body and a silkworm gut suture is finally placed at the edge of the anus, which includes the united edges of the sphincter. This is placed under guidance of a finger in the rectum.

---

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

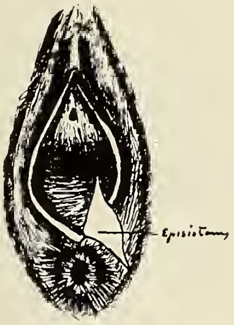


Fig. 1. Episiotomy.

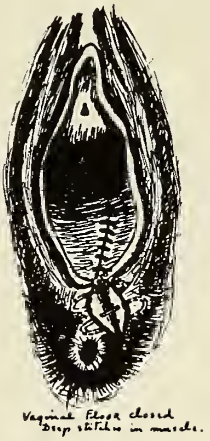


Fig. 2. Episiotomy repair.

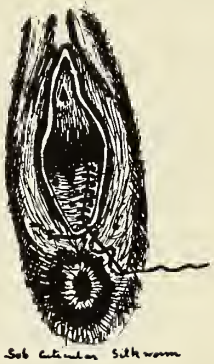


Fig. 3. Episiotomy repair.

The patient is kept on a liquid diet for four days and the bowels moved by magnesium citrate and a sweet oil enema on the fourth day.

The success of the repair depends on the degree of asepsis maintained. The presence of the opening into the rectum makes this difficult but careful attention to detail and the free use of mercurochrome make the effort well worth while and often perfect results are obtained.

LACERATIONS OF THE CERVIX

The question often is discussed as to whether the cervix should be examined and repaired at once.

In normal spontaneous labors and in low forceps deliveries it is not my practice to expose and repair the cervix. After difficult deliveries the cervix should be inspected, particularly if there is bleeding which may be coming from a cervical tear.

In home deliveries with insufficient help and poor light I would be inclined to let the cervix alone as long as there is no undue bleeding.

Cervical repair is not so very difficult if proper exposure and visualization can be obtained. The first and most important step is to have some one press down on the fundus, thus bringing the cervix to the vaginal outlet. The anterior and posterior lips are then grasped with sponge forceps and gentle traction made downward. By placing a retractor in the vagina on the side of the tear and pulling the cervix the opposite way a good exposure is made. A laparotomy sponge rolled into a compact cylinder and inserted into the cervix and lower uterine segment will tend to keep the blood from the uterus out of the operative field. The placenta may be either expressed first or not according to the amount of bleeding.

The first stitch of No. 1 chromic catgut is placed at the top of the tear. This will control most of the bleeding. Interrupted sutures are then placed about ⅜ to ½ inch apart. The cervix heals well and excellent results are obtained.

EPISIOTOMY

As a preventive measure against lacerations of the lower birth canal, excluding, of course, the cervix, there is nothing better in my opinion than an episiotomy. A central episiotomy for spontaneous labors after the perineum has become somewhat stretched and dilated by the descending head works very well. However if a central episiotomy is done before some stretching of the perineum has occurred the incision is liable to extend down to and often through the rectal sphincter.

In hard mid-forceps delivery a lateral episiotomy should be done, a deep incision being made before a tear occurs. This releases the pressure on all parts of the vaginal outlet and prevents tears and stretching of the tissues at the base of the bladder, injuries to the vaginal floor and tears in the rectum.

If the incision is accurately repaired a condition approaching a nulliparous outlet will be found two months after delivery. However, the scar will be tender for some weeks.

HEMATOMA VULVÆ

This is a rather rare condition. The lesion consists of a rupture of a vessel in the vulva and in one of my cases this was no external tear. The labor was spontaneous and nothing unusual was noticed at the time of delivery. About one hour later the interne phoned and said that the woman was in shock, with a weak thready pulse and clammy skin, and suffered severe pain in the vulva. He further reported that there was a large fleshy mass presenting at the vulva, which he said resembled the placenta a little which of course it was not. He said he had tried to remove it but couldn't. I went to the hospital and found a large hematoma one-half the size of a child's head with no sign of external tear. The patient was anesthetized, the hematoma opened, the blood removed and a bleeding vein found and tied. The patient was given some glucose intravenously and recovered rapidly.

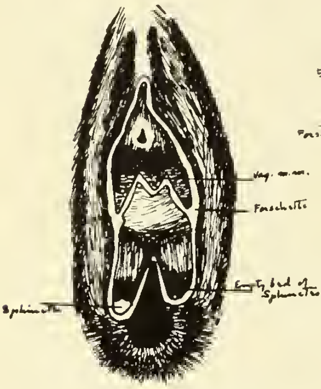


Fig. 4. Third degree laceration.

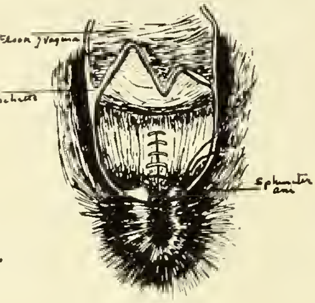


Fig. 5. Repair third degree laceration.

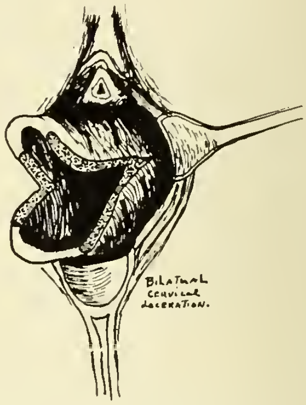


Fig. 6. Laceration of cervix.

ABRUPTIO PLACENTÆ

This serious condition is often associated with toxemia. The next most common cause is torsion of the uterus (Polak) with blocking of venous return. Polak says that taking the knee chest position three times daily during pregnancy has diminished the frequency of this condition, in his clinic. Direct trauma may also be a factor.

Symptoms consist of a sudden severe adbominal pain, usually with some vaginal bleeding. External bleeding is often a later sign. The pain is constant and the uterus becomes boardlike. Some shock is always present. In severe cases no fetal heart is heard. The symptoms may appear before true labor starts or in the early part of labor.

Treatment may be conservative or radical.

If the patient is a primipara with an undilated cervix and labor has not begun, my personal preference is for cesarean section. The uterus may be sutured and left if it contracts well and there is no bleeding, and if there has been no vaginal manipulation. Otherwise a hysterectomy should be done. Blood transfusion is very important and should be carried out if possible, otherwise glucose or acacia should be given intravenously.

Conservative treatment consists of morphine for shock, preparations for delivery, and rupturing the membranes. The cervix and vagina are packed with mercurochrome gauze and a tight abdominal binder applied. Three minim doses of pituitrin are given every twenty to thirty minutes. The blood pressure and hemoglobin are watched every half hour and a blood transfusion given. If labor is progressing all may be well. Delivery should be effected as soon as possible. After delivery the placenta is expressed or manually removed and it is usually wise to pack the uterus with mercurochrome gauze at once.

If however, under the conservative treatment, labor does not progress, the blood pressure and hemoglobin become quite low, and the general picture changes for the worse, section must be done. As there has now been considerable vaginal manipulation a hysterectomy must also be done. However, if conditions forbid operative treatment, good results often follow the more conservative method of treatment.

RUPTURED UTERUS

The uterus may rupture as a result of violent ontractions in the presence of an obstacle preventing advance of the head or it may be ruptured y the efforts of the attending physician to deiver the baby.

After rupture has occurred, the only recourse is laparotomy preceded or followed by blood transfusion or glucose intravenously. If there has been no vaginal manipulation, it may be wise to remove baby and placenta and repair the rent, or it may be necessary to remove the uterus, depending on the location of the rupture and possibility of infection.

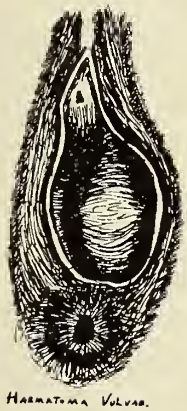


Fig. 7. Hematoma vulvæ.

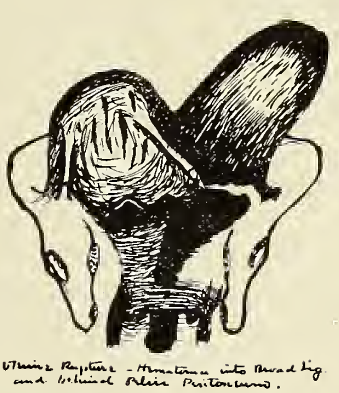

Uterine Rupture - Hematoma into Broad Lig. and Internal Pelvic Peritoneum.

Fig. 8. Rupture of uterus during version.

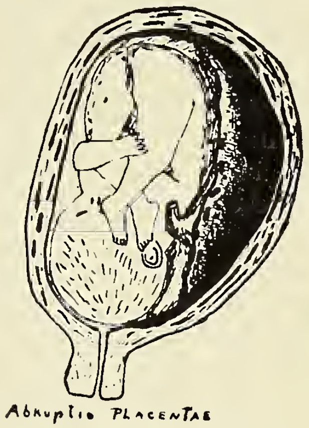


Fig. 9. Abruptio placentæ.

The first type, as a result of violent contracons, often following the administration of ituitrin, is usually preceeded by tetanic contracons and often a Bandls contraction ring is resent. If the uterus completely relaxes between ains, even if they are very strong, there is not uch danger of a rupture. This type probably oes not occur all at once and at the first slight earing the uterus becomes irritable and becomes tanically contracted. The succeeding hard conactions occurring on top of the tetanic contracon completes the rupture. This type usually uptures through the body of uterus into the eneral peritoneal cavity. After complete rupture ccurs the contractions cease, the presenting part, not fixed in the pelvis, recedes and the patient anifests the usual signs of shock. The conacted uterus may be felt alongside the fetus in e abdominal cavity.

In the presence of symptoms suggesting the mminence of rupture, the uterus should be ven a rest by a dose of morphine or if the mptoms are very marked and the morphine es not have the desired result, the patient ould be anesthesized and preparations made r instrumental delivery, embryotomy or sarean section. Version should not be attempted der these conditions.

The other type occurring during the course of operative delivery generally occurs during a version or it may occur during a forceps delivery through a poorly dilated cervix, the cervical tear extending up into the lower uterine segment.

The greatest safeguard against rupture of the uterus during a version is a perfectly relaxed uterus, if the bag of water has long been ruptured and the uterus is tetanically contracted or a contraction ring is present, version is difficult and very dangerous. Deep anesthesia is essential, either by chloroform or ether. Ethylene is not sufficient to relax the uterus and all manipulations must cease during the slight contractions which occur even during anesthesia.

A rupture of this type is usually in the lower segment and often into the broad ligament as in the illustration. There is generally profuse hemorrhage, the uterus contracts poorly and the patient at the conculsion of the delivery is in shock. With these symptoms the interior of uterus should be explored at once to rule out rupture.

In one case seen, the attending physician gave a history of delivery by version of a live baby, profuse hemorrhage and considerable shock. The patient was in poor condition all the time following delivery and nearly every day a rather brisk bleeding occurred. Several blood transfusions were given. When I saw her six days later there was a hard mass in the left lower abdomen separate from the uterine body, extending high up toward the kidney region and the patient was in bad shape. A diagnosis of rupture into the broad ligament behind the peritoneum was made. She did not seem to be in a condition to withstand a laparotomy and so she was anesthesized and the uterus explored with the findings as illustrated. A large blood clot was removed and the cavity packed; it was impossible to identify any bleeding artery although it was surmised that the uterine artery had been torn. However, the packing failed to check the bleeding and the patient died eight days after delivery.

An autopsy was obtained with the findings as illustrated. Note that the cervix itself was not torn. At autopsy it was very difficult to identify the torn uterine artery, so great was the infiltration with blood. This supported our opinion that laparotomy was not advisable as the operation would have been long and difficult.

In conclusion I only want to emphasize the fact that the results you will obtain in treating the accidents of pregnancy will depend on your previous conduct of the case. If labor has been conducted in an aseptic manner with no vaginal examinations and your patient has not been infected, the results will be fairly satisfactory. If on the other hand there has been much manipulation and the patient has been infected the accidents of labor will result disastrously.

DISCUSSION OF PAPERS BY DRS. BERGHEIM, MUSSEY AND MANLEY

Dr. J. C. Litzenberg (Minneapolis): This is one of the proudest moments of my life for the reason that the exhibit this morning is a testimony that in Minnesota conservative obstetrics is practiced. You have learned from this symposium this morning one of the reasons why the maternal mortality in Minnesota is lower than in any state in the Union.

You have heard specialists discuss various phases of the subject, and you have also heard a country doctor read a paper which is worthy of any specialist and which shows why our maternal mortality is being reduced in Minnesota until it is now the lowest because maternal mortality is not reduced by specialists but by the general practitioner.

The work of Dr. Berkwitz is of special significance in the question of what occurs in the early toxemias of pregnancy. There has been too much emphasis placed upon the toxic character of the vomiting of pregnancy. Much of the early vomiting of pregnancy is due to neurosis and should be treated as such. However, if we cling to this idea too tenaciously with a one-track mind, just because a majority of the cases are not toxic, we are liable to fall into error as Dr. Berkwitz's paper has proven.

It is unfortunate that so many of the patients that Dr. Berkwitz has reported, died. One of them died under my hands on the table because we did not see her early enough to recognize the toxic nature of her condition and to empty the uterus. The lesson in this is that when patients do not respond to the usual treatment for vomiting of pregnancy, they must be assumed to be toxic and the uterus emptied in time to save the patient. Of course, a good many of them come into our clinic in rather a severe condition. But I think the lesson of this is that the vomiting of pregnancy, the early vomiting of pregnancy, may be toxic, and the patient may lose her life. These patients, if they do not respond to the ordinary treatment, should be promptly aborted.

One of the reasons I feel so proud of this program this morning is that it is a prophylactic program. Every one of the speakers has emphasized the necessity of prophylaxis, and they are bringing into the picture the necessary emphasis which should be placed upon postpartum as well as antepartum care. In other words, they have emphasized, particularly Dr. Mussey, Dr. Bergheim and Dr. Barry, the necessity of following these women in after-care, not only until a woman is delivered of a healthy, living baby, but that woman must be followed until she is restored to perfect health.

Dr. Barry has emphasized the postpartum care, because of the consequences, immediate and remote, of puerperal infections.

When we realize that we have endocarditis, peritonitis, abscess of the lung, nephritis, following the toxemias of pregnancy and following the infections of delivery, we may then lay emphasis on the postpartum care, which means that the woman should be watched until she is restored to perfect health.

Dr. Manley emphasized the necessity of prophylaxis in the accidents of labor, because many of these accidents can be prevented. I was glad to note that he took such a sane position. That word "sane" is a favorite of mine, because I don't exactly like the word "conservative" because one is apt to think that the conservative is the man who does nothing.

I think the late Dr. J. E. Moore described a conservative in the best words that I have ever heard when he said: "A conservative is the man who knows when and how to be radical."

These men you have listened to this morning are possessed of skill to do any of the radical procedures of obstetrics, but their sanity keeps their feet on the ground.

I was particularly pleased with the figures that Dr. Mussey presented, because you know that we have been going through two particular things in regard to the toxemias of pregnancy which have considerably disturbed us.

About twelve years ago from Williams' Clinic came a paper which said that the women who have had eclampsia or toxemia are no more liable to have subsequent attacks (and the figures even showed a lesser liability) than the women who have not had it. We have also been going through a discussion among the pathologists. "Is the condition of the kidney with which we deal in the toxemia of pregnancy, a nephrosis or a nephritis?" We have been deceived by the large number of women who apparently completely recover from their toxemias of pregnancy.

In the marvelous symposium on the kidney, which was held at the University last summer by men from all over the world who had made special studies of the kidney, the idea of nephrosis was very vigorously combated. If those who advocate the idea of the nephrosis are compelled to surrender to the idea that this thing with which we deal, as far as the kidney is concerned in the toxemia of pregnancy, is a nephritis, then Dr. Mussey has the explanation of the figures which he presented. They are rather striking.

Let me say just one word about so-called recurrence. I doubt if this is a true recurrence of a preeclampsia. I think it is symptomatic recurrence because the kidney is damaged. I have had a theory. You know, a theory is something which you figure out more or less from a philosophical standpoint, but data for which does not exist for its absolute proof. My theory has been this, that whether a woman has trouble in a future pregnancy, when she has had a previous toxemia, depends upon the amount of damage done to her kidneys during her toxemia. I believe this is logical. I admit it is only a theory, but Dr. Mussey brought a very great deal of proof of it in his paper this morning.

Dr. Mussey emphasized the necessity of prophylactic care for these women. I know of nothing in the practice of obstetrics that needs postpartum care more than to follow every woman who has had a toxemia, by observation and treatment until she has returned to absolutely normal health; in other words, until the albumin has all disappeared, until her high blood pressure has disappeared, but that is not all—until we know that her kidneys are functioning properly. Even then we cannot be assured that she will not have a recurrence later on, because if my theory be true that whether she has subsequent atacks or not depends upon the amount of damage done to that kidney, even then she may have recurrence, because we all know that the human kidney is four or five or maybe more times greater in functional tissue than is necessary to preserve life. Therefore, a kidney may be considerably damaged so that the woman may go on to good health and live out her life expectancy if an additional burden be not thrown upon those kidneys, which is done by a subsequent pregnancy. Therefore, when this subsequent pregnancy throws that extra burden upon the kidney, the damaged, although apparently healthy, kidney is found to be insufficient.

I have left the discussion of Dr. Bergheim's paper to the last for the reason that he is the one who exemplifies the general practitioner in Minnesota. There are men like him all over this state who are practicing sane obstetrics. We specialists in the Twin Cities who are so proud of our practices do not have more patients in obstetrics than Dr. Bergheim has out in a village of 1,000 people. He is practicing that thing in the country which we as teachers have preached for years. When we talk about this prenatal care and this care during labor which Dr. Barry emphasized, and the postnatal care which particularly Dr. Mussey has emphasized, many country practitioners say: "You don't know anything about it. You are nothing but a city guy and a teacher." You won't listen to me; I don't blame you much. Nevertheless my early practice was in a labor Ward of Minneapolis. If there is anything worse in the country than the things I met in city practice, when I had to sleep on the fuzzy side of a rug and often on the soft side of a pine board during the night, I should like to know it. Nevertheless, I admit I am from the city and I am only a teacher. But Dr. Bergheim and men of his type all over this state are practicing sane, complete obstetrics in the country and I believe that is the reason that the maternal mortality in Minnesota is lower than any state in the Union.

ALLERGY AND PNEUMOCOCCUS LOBAR PNEUMONIA*

H. A. Reimann, M.D.
Minneapolis

THE discovery of anaphylaxis and its relation to protein intoxication has been followed by numerous efforts to draw an analogy between this phenomenon and the manifestation of certain acute infectious diseases. At present it appears that allergy or hypersensitiveness to bacterial protein plays an important rôle in tuberculosis, syphilis, acute rheumatic fever, and probably in acute nephritis. The suggestion that lobar pneumonia as a disease represents a form of allergic or anaphylactic reaction was made by Friedberger and by Rosenow in 1911. Certain features of lobar pneumonia, such as the sudden onset with chill and fever and the sudden drop of the fever, resemble the reaction which often follows the injection of foreign protein in an experimentally sensitized animal. Numerous attempts have already been made to demonstrate the presence of allergy in humans and in experimental animals by employing skin tests, using the pneumococcus or its products as antigen. Varying degrees of success have been attained.

Interest in the subject of the allergic nature of lobar pneumonia has been recently renewed, chiefly through a series of publications by Lauche[1, 2, 3] and by the decisive experiments of Avery and his associates[4, 5] concerning specific anaphylaxis with the pneumococcus and its products. Lauche approaches the subject by comparing the difference in the reaction of young infants as compared with adults to pneumococcus infection. He points out that infants less than four months of age seldom contract pneumococcus lobar pneumonia, and that when infection does occur, it is mild. The explanation for the difference in response in infants and adults assumes that infants have not as yet had the opportunity to become sensitized to the pneumococcus, and thus do not react in a violent, anaphylactic manner when exposed to an infecting dose of pneumococci. With increasing age, opportunities for contact with the pneumococcus increase in proportion. Numerous mild infections, for example, sinusitis, mastoiditis or conjunctivitis, may occur in early childhood and later, which eventually induce a state of hypersensitiveness reaching its height in adult life, at a time when lobar pneumonia is most common and most severe. It is Lauche's contention that pneumococci invade the lung tissue of a sensitized individual near the hilum or the adjacent lymph nodes, where the first inflammation and bacterial growth occur. The inflammatory reaction at the hilum obstructs the lymphatic drainage of the lobe and induces a back flow of lymph toward the periphery. By this reversal of lymph current, favored by the sparseness of valves in the lymph channels, pneumococci or their products (antigen) are distributed throughout the lobe. The distribution of antigen throughout the lobe can probably also be accomplished by the normal ebb and flow current of the pulmonary lymph stream. When the concentration of antigen in the sensitized lung attains the stimulation threshold (Schwellenwert), the explosive anaphylactic reaction manifested by the sudden chill, fever and outpouring of exudate occurs. The height of the threshold depends upon the degree of sensitivity. Lauche's theory is attractive and has considerable experimental data to support it.

Soon after Friedberger suggested the allergic nature of pneumonia, both he and Schittenhelm[6] succeeded in producing sterile anaphylactic pneumonia in sensitized guinea pigs by the introduction of the shocking dose of protein into the lungs. Ishioka's histologic studies[7] demonstrated that in many instances the histologic picture of the pneumonia produced in this manner closely resembled that of a lobar pneumonia in humans.

As early as 1904, before allergy was considered, Wadsworth,[8] in endeavoring to induce pneumonia in rabbits by intratracheal injection of pneumomoccus cultures, noted that inflammatory localization in the lung occurred only in those animals which had previously been immunized. Otherwise the rabbits would either remain well or would promptly die from pneumococcus septicemia. Twenty years later, Stillman and Branch[9] noted the same requirement necessary to produce pulmonary localization of pneumococcus infection in experimentally infected mice, namely, that pulmonary inflammation occurred only in mice which had previously been partially immunized. Normal unimmunized mice promptly died from an overwhelming generalized infection. Although Wadsworth, and Stillman and Branch considered partial immunity as one of the chief factors determining the pulmonary localization of infection, it appears now that the state of hypersensitivity must also be considered.

---

*From the Medical Service, University Hospital, Minneapolis.

Sharp and Blake[10] have recently reported experiments similar in nature to those of Friedberger, Schittenhelm and Ishioka. They have found that pneumococcus autolysates elicit an acute exudative inflammatory response when injected intratracheally into the lungs of specifically sensitized rabbits. Similar intratracheal injections in normal (non-sensitized) rabbits failed to incite any pulmonary reaction. In other words, the inflammatory reaction in the lungs in response to the contact with pneumococcus autolysate depends upon the specific allergic state of the animal. It was also found that a fairly close parallelism exists between cutaneous and pulmonary hypersensitiveness to pneumococcus autolysates in the rabbit.

Important observations have also been made concerning the relation between immunity and pneumococcus infections in humans. Clough,[11] and Robertson and Cornwell[12] have shown that many normal individuals possess demonstrable immune bodies in their blood. Furthermore, Robertson, Terrel, Graeser and Cornwell[13] have shown that individuals with demonstrable specific immune bodies in their blood serum may contract lobar pneumonia. They explain this apparently paradoxical fact by assuming that local changes take place in the lung, of such a nature as to provide conditions for the growth of pneumococci, while at the same time protecting them from the bactericidal action of the immune bodies in the blood. However, another explanation is possible, as the latter investigators also suggest, namely, that allergy may play a rôle. The demonstrable antibodies were probably provoked by previous mild pneumococcus infections, and it is possible that these patients are both partially immune, and hypersensitive as well.

Avery and Tillett[4] have shown that anaphylactic shock can be induced by the injection of small amounts of type-specific carbohydrate derived from pneumococci in guinea pigs passively sensitized with homologous antipneumococcus rabbit serum. Tillett and Francis[5] and Kramár and Gyüre[14] have shown that specific skin reactions characterized by urticaria-like wheals, may be obtained in pneumonia patients after the crisis at the site of an intradermal injection of pneumococcus carbohydrate. The cutaneous response when obtained was always elicited by the carbohydrate homologous to the type of pneumococcus which caused the infection. The skin sensitivity was found to parallel the presence of circulating type-specific antibodies. The presence of sensitivity was, however, independent of the presence of type-specific antibodies; in other words, immunity and hypersensitivity are not identical. The independence of pneumococcus immunity and allergy has been further demonstrated by Rich and Brown.[15]

Comment: There are at present, therefore, a number of facts and theories in regard to the allergic nature of lobar pneumonia:

1. Anaphylactic pneumonia has been produced experimentally.

2. It is usually necessary to use animals which have previously been exposed to pneumococci before pneumococcus lobar pneumonia can be produced experimentally.

3. Specific skin hypersensitiveness is demonstrable in patients after an attack of lobar pneumonia.

4. Individuals with circulating specific immune bodies may develop lobar pneumonia.

5. The theoretical consideration of Lauche explains the mildness of lobar pneumonia in young infants on the basis of a lack of hypersensitiveness.

Although a number of factors seem to indicate the importance of hypersensitivity in lobar pneumonia, others suggest that hypersensitivity is not alone responsible for the characteristic reaction. Lobar pneumonia may on rare occasions occur in very young infants, who, according to Lauche, are not yet sensitized. Under these circumstances the pneumonia often runs a mild course and probably involves factors of immunity only. Non-immune infants, like highly susceptible experimental animals, often die from an overwhelming septicemia without pulmonary localization. In many adults lobar pneumonia commences rather insidiously, without manifestations of the prompt allergic reaction characteristic of hypersensitivity. It is possible, however, that these atypical manifestations may only indicate the varying intensity of the two factors of immunity and hypersensitivity, and that under certain circumstances one or the other may condition the response. Hypersensitiveness does not appear to play any rôle whatever in the production of experimental pneumonia in monkeys (Blake and Cecil[16]) or in dogs (Terrell and Robertson[17]).

There are obviously many facts to be discovered before the exact relationship of hypersensitivity to pneumonia is established, but there are many indications that the allergic state may, at least, have some influence and may modify the response to infection to some extent. The question arises as to the subtle equilibrium which apparently exists between immunity, hypersensitiveness and infection. What part do the commonly recognized predisposing factors play? Do they diminish immunity and permit the invasion and growth of pneumococcus and subsequent contact of these organisms or their products with a hypersensitive lung? Is immunity decreased or is hypersensitiveness increased, or are both factors involved? Does the supposed predisposition of one attack of pneumonia to subsequent attacks depend upon a continual hypersensitive state or are individuals who have repeated attacks of lobar pneumonia unusually hypersensitive or unusually non-immune?

SUMMARY

A recent theory regarding the pathogenesis of lobar pneumonia as advanced by Lauche, regards allergy or hypersensitiveness to pneumococcus as an important factor. The mechanism of infection operates as follows: pneumococci invade the lung tissue or the bronchial lymph nodes of a sensitized individual. The first inflammation occurs near the hilum, from whence pneumococci or their products (antigen) are distributed throughout the lobe which drains into the area, by means of the reversal of the lymph stream. When the concentration of antigen attains the stimulation threshold, the sudden inflammatory exudative reaction of lobar pneumonia occurs.

Other experimental data published by numerous investigators further suggest that pneumococcus lobar pneumonia is conditioned in part, at least, by a state of allergy or hypersensitiveness of the individual to the pneumococcus.

BIBLIOGRAPHY

1. Lauche, A.: Zeitschr. f. Geburtsh. u. Gynäk., 91:627, 1927.
2. Lauche, A.: Deutsch. med. Wchnschr., 53:55, 1927.
3. Lauche, A.: Handb. d. spez. path. Anat. u. Hist. Henke u. Lubarsch. Berlin, 3:707, 1928. Nachtrag, p. 915.
4. Avery, O. T., and Tillett, W. S.: Jour. Exp. Med., 49:251, 1929.
5. Tillett, W. S., and Francis, T.: Jour. Exp. Med., 50:687, 1929.
6. Schittenhelm: Deutsch. Kong. f. Inn. Med., Wiesbaden, 1912.
7. Ishioka, S.: Deutsch. Arch. Klin. Med., 107:500, 1912.
8. Wadsworth, A. B.: Am. Jour. Med. Sci., 127:851, 1904.
9. Stillman, E. G., and Branch, A.: Jour. Exp. Med., 40:733, 1924.
10. Sharp, E. A., and Blake, F. G.: Jour. Exp. Med., 52:501, 1930.
11. Clough, P. W.: Bull. Johns Hopkins Hosp., 35:330, 1924.
12. Robertson, O. H., and Cornwell, M. A.: Jour. Exp. Med., 52:267, 1930.
13. Robertson, O. H., Terrell, E. E., Graeser, J. B., and Cornwell, M. A.: Jour. Exp. Med., 52:421, 1930.
14. Kramár, E., and Gyüre, D.: Arch. f. Kinderheilk., 89:73, 1929.
15. Rich, A. R., and Brown, J. H.: Proc. Soc. Exp. Biol. and Med., 27:695, 1930.
16. Blake, F. G., and Cecil, R. L.: Jour. Exp. Med., 31:403, 1920.
17. Terrell, E. E., and Robertson, O. H.: Proc. Soc. Exp. Biol. and Med., 27:973, 1930.

VINCENT'S DISEASE*

Robert I. Rizer, M.D.
Minneapolis

By VINCENT'S DISEASE I mean an infection caused by the fusio spirochetal organism of Vincent. It is usually located in the mouth, but it may be found in any part of the body. The disease may be acute or chronic; it is infectious, and it may cause death.

At the present time Vincent's infection is of greater interest than ever before because the disease is decidedly on the increase and has been since the Great War.

We may well ask, what is the reason for such an increase? Is it not a fact that besides the congestion and the increase in the prevalence of the general infections, there must be carriers, people chronically infected who are not recognized as such and who are disseminating the disease?

Mucous membrane contact with infected material, usually saliva, is the common method by which the disease is contracted. Coughing, unclean dishes, cigarettes, pipes, dental instruments, as well as kissing, may be factors.

In 160 individuals Miller found the organism in 77 per cent; Brams discovered its presence in the crypts of 82 per cent of 100 pairs of tonsils. It has not been present in the mouths of edentulous people, and we have rarely found it in what we have termed normal mouths. It is probably an opportunist acting in a secondary role—more saprophitic until some conditions arise which lower the resistance of the local tissues, such as: erupting third molar teeth, pyorrhea, receding gums, pre-existing pockets, cavities that are not easily accessible to the tooth brush, faulty dentistry, unclean mouths, tobacco, mercurial stomatitis, also the associated diseases such as adenoids, diphtheria, measles, syphilis, scarlet fever, purpura, sepsis, diabetes, tuberculosis, malnutrition, scurvy, and malignant growths; then the organism may grow and become the dominant cause of the pathological condition.

To quote from Tunnicliff: "The fusiform bacilli and the spirilla with which they are always associated are different forms in the life cycle of one organism.

"The organism is an obligate anerobe; it grows at 36 degrees C. but not at room temperature. A slightly offensive odor is given off in successful cultures. The bacilli are non-motile and insoluble in 10 per cent saponin or bile.

"Cultures were made anerobic according to Wright's method, by saturating the cotton stopper with a 5 per cent solution of sodium hydroxide, a piece of pyrogallic acid the size of a pea having been placed on the plug; the tube was closed with a cork and sealed with paraffin.

"The colonies on blood agar are whitish with a slightly violet tinge, smooth and moist, edges regular, from 1 to 3 mm. in diameter. In ascites agar shake cultures, the colonies are lenticular with even borders, and are slightly brownish. When well separated, they may become larger. A puff-ball appearance of the colonies has not been observed.

"The organisms grow well on Loeffler's blood serum, autoclaved rabbit brain, 1 per cent dextrose broth, distilled water and ascitic fluid 1:3, plain and dextrose broth with ascitic fluid 3:1, plain and dextrose agar to which blood or ascites fluid has been added in the proportion of 3:1. It requires some body fluid for growth, but enough may be carried over on inoculation for one generation. In dextrose broth the growth is diffuse at first, later settling into clumps; in other fluid mediums it is flocculent. Cultures were also successful on blood agar and in ascites broth, to which were added solutions of either 5 drops of 20 per cent sodium chloride solution, 1-2 drops of 10 per cent sodium hydroxide or 1-2 drops of 10 per cent acetic acid to each 5 c.c. of medium. Larger amounts of these substances generally inhibited growth. The addition of fresh rabbit kidney tissue did not appear to enhance the growth. The hydrogen-ion concentration of the medium was 7.4 to 7.6.

"The bacillus ferments lactose, dextrose, salicin and inulin, but not mannite, maltose, or sacchrose."

Veillon, Zuber, Weaver, and Tunnicliff on injecting pure cultures subcutaneously into animals produced local abscesses. Smith injecting sputum into the groin of guinea pigs produced local abscesses at the point of injection, and metastatic abscesses in the liver, spleen, and lungs. The same combination of organisms was present in the metastatic abscesses as in the original sputum. By inoculation into the groin of other animals the disease was transmitted from guinea pig to guinea pig at ten day intervals for five passages. Pus from one of these pigs was inoculated in 0.25 c.c. amounts into the tracheas of four rabbits; two died of pulmonary gangrene and two of pulmonary abscesses associated with empyema.

---

*Read before the Minnesota Society of Internal Medicine, Minneapolis, April 13, 1931.

The bacilli appear as pointed, straight, or curved rods 2-10u in length. The spirilla appear as straight or curved forms with 2-8 curves and from 3-10u in length. They stain well with gentian violet and carbo-gentian violet. We have used the gentian violet in our work. A platinum needle is applied to the suspected areas; the material obtained is spread on a clean glass slide, dried, and fixed in heat; the stain is then applied, washed, dried, and examined under an oil emersion lens.

On routine examinations we have been finding for some time patients with the soft parts about some teeth swollen; the margins have been very red and have been slightly separated from the teeth. These parts might be covered in part or whole by a greyish exudate; ulceration has usually not been present, the breath has had an unpleasant odor, and in the mild cases there have been no constitutional symptoms. These people were sent to their dentist for care. In some cases a diagnosis of gingivitis or pyorrhea was made; mild treatment was given. We were surprised to see that these people did not improve.

What was this condition? Was it a local infection in the mouth, a local manifestation of a general infection, a deficiency disease, or a general blood disease? The routine physical examination had been made and the laboratory examinations which included: complete blood, blood metabolites plus calcium, platelets, bleeding and clotting time, Wassermann and Kahn, urine, and gastric secretions. X-rays of the teeth were made. We then added to our routine the examination of smears made of the material obtained from the suspected teeth. In our first 100 cases which presented the above picture we found that 98 per cent showed large numbers of the Vincent organisms. Since that time we have found 100 per cent positive smears.

The patients are sent to their dentist with a diagnosis of chronic Vincent's infection and a combined treatment is administered. We are now getting results.

Coöperating with the dentist, the doctor should see that the patient is in the best possible physical condition. A liberal general diet should be given avoiding condiments, pickles, and highly seasoned and coarsely divided food. Smoking, and the use of tooth picks and dental floss should be avoided. The dishes and towels should be isolated. The patient should be instructed to cover his mouth whenever he coughs or expectorates. Any sputum should be burned.

The dentist, on his part, should employ a regime of mild instrumentation and cleaning the tissues, avoiding any trauma and procedure that might lower the resistance of the soft parts which would make a nidus for any organism. In addition we like to use a mouth wash composed of equal parts of alcohol, peroxide and glycerine, which may be used as a spray about the teeth. A thick perborate paste may be used locally. Cleaning the teeth with a soapy tooth paste aids in removing the organism. Should there be extensive infiltration or involvement, a local application of a 10 per cent solution of salvarsan may be applied.

It will require several days before the soft parts will have a healthy appearance. It is at this time that corrective dentistry should be started. This is most important as the future condition of the patient's mouth rests upon the treatment by the dentist, i.e., cleaning the mouth and teeth, and correcting any abnormal condition. This will insure the patient against recurrence once a cure is effected.

In any mouth in which Vincent's infection is present, it is dangerous to extract teeth or perform any surgical operation about any part of the body until the infection is controlled or cured.

The case of one man is instructive. He had had an infected mouth which had been treated in the East. Upon his return to Minneapolis, a chronic recurrent appendix became acute; his mouth seemed to be clear but no smear was made at this time. The appendix was removed; his condition following the operation remained normal for two days, when following a slight chill his right and then his left parotid glands swelled. The swelling increased so that his face appeared to be round; his temperature was 104°; he was delirious; one of his finger joints was swollen and painful; a thick yellowish-green material could be expressed from Steno's ducts. The cultures and smears were said to contain only the usual pus producing organisms. The patient died.

Within a short time another man came to see us because of a swollen jaw. We found him with a high fever and his right parotid gland was badly swollen. The soft parts about the upper and lower teeth on the right side appeared as described above. The smears made from the material from Steno's ducts were examined immediately and were found to contain large numbers of Vincent's organisms. A diagnosis of Vincent's infection was made and four days later, following proper local and general care, the man left the hospital with no symptoms and the gland nearly resolved.

Another case is that of a man who had been sick two days, delirious, with a high temperature. He had a facial erysipelas involving the nose, cheeks, forehead, eyes, ears, and neck. The mucous membrane about the teeth was very red and covered in some areas by an exudate; his breath was foul. Smears showed the presence of large numbers of Vincent's organisms. He was taken to the hospital, the erysipelas was treated by X-ray, neo salvarsan was given to him intravenously and was used locally in his mouth. His dentist coöperated in the treatment, and the patient made a splendid recovery.

The sinuses and bones of the head are frequently infected by Vincent's organisms, and from these areas nearly every part of the body may be infected. Osteomyelitis, meningitis, brain abscesses, chronic otitis, media abscesses and gangrene of the lungs, pericarditis, ulcers of the stomach or rectum, abscesses in the glands or any viscera may be caused by Vincent's organism. In fingers infected from biting the nails, and in the intrauterine secretions following abortions, Vincent's organisms have been found.

In the acute Vincent's infections there is an abrupt onset with chills, fever, weakness, general aching, and local symptoms such as burning, pain, salivation, dysphasia, tender teeth and swollen submaxillary glands. The red swollen soft parts about some or all of the teeth will be seen with the red infiltration extending locally or generally through the mouth into the pharynx, covered by an exudate and a local or generalized ulceration. A diagnosis is easily made in the chronic form. The appearance, with the positive smears and culture, identify Vincent's disease.

The infection should be recognized and proper treatment instituted early before destruction of the tissues occurs. In this case the prognosis is excellent and the treatment of the disease is short. Where tissue destruction is present, the infection is difficult to manage and the treatment will be prolonged.

If the dentist and physician coöperate in recognizing and treating Vincent's disease, great headway will be attained in the stamping out of this disease which is becoming more and more prevalent.

THE FOUNDING OF THE RAMSEY COUNTY MEDICAL SOCIETY*

John M. Armstrong, M.D.

Saint Paul

SIXTY-ONE YEARS ago this month the Ramsey County Medical Society was born. The minutes of the first meeting and in fact the minutes of every meeting since, are intact and in our possession. Those physicians in actual attendance at the initial meeting were as follows: D. W. Hand, A. Wharton, Wm. Banks, C. W. Boardman, S. D. Flagg, E. H. Smith, John B. Phillips, Wm. Ray, Samuel Willey, Frank Lawson, and Adelard Guernon. In addition to these the following were admitted as charter members: Thomas R. Potts, David Day, A. G. Brisbine, J. H. Stewart, Franklin R. Smith, John Steele, J. H. Murphy, Brewer Mattocks, Chas. E. Smith, Martin Hagan, and William Baldwin.

Their portraits may be seen grouped together on our Library walls. Unfortunately these portraits were collected many years after the event of our founding, and in most cases portray these men much older than they were in 1870. You will note on reading the minutes of the first meeting that the Society considered itself a reorganization of the St. Paul Academy of Medicine and Surgery.

In 1901 when Dr. Boeckmann read a history of our society as his retiring presidential address, he was able only to state that in our library was a minute book of this older organization of physicians with the minutes torn out. All that was known about the Academy was the names of the members which were written on the inside of the front cover. Dr. Boeckmann expressed the hope that at some future date the missing pages might be found, a hope not yet fulfilled.

Nevertheless research has given us much information about the Academy. It was organized March 1, 1860, its membership consisting of twelve men as follows: T. R. Potts (Pres.), A. G. Brisbine (V. P.), A. Wharton (Sec), John Steele (Treas.), Samuel Willey, J. H. Stewart, F. R. Smith, J. A. Vervais, Wm. H. Morton, E. Braun, Francis Reiger, and D. W. Hand; practically the same who were the majority of the founders of our society. We have accomplished much in the past sixty years, but the older society also accomplished a great deal in the six years of its activity, and no doubt the ideal for which the older society strove was the ideal kept in view when our present society was established, though we have been slower in our progress.

To those of you who think our present dues too high, I might mention the fact that the dues of the Academy were twenty-five dollars a year, and none of it was paid to the State Association, which did not then exist. The Academy maintained "two gas lighted rooms on Third Street, above George Benz Beer Saloon," had a chemical laboratory, an electrical machine for physiological experiments, and owned a compound microscope of the best make obtainable at that time. It is stated that when the scientific meeting adjourned a social meeting often continued downstairs.

The Chicago Medical Journal for June, 1861, in an editorial about the Academy, states, among things highly complimentary, that at the end of the year the receipts were $620.72, expenditures $462.93, and a cash balance to date of $367.07. You may wonder where all this money came from. On April 15, 1860, we find that the newly formed Academy petitioned the City Council of St. Paul, in a letter signed by Doctors Potts, Brisbine, and Wharton, that their president, Dr. Thomas R. Potts, be appointed city physician. The council thereupon elected Dr. Potts city physician for one year. The emolument of this office was five hundred dollars per year. The twelve members of the Academy then took turns of a month each, acting as city physician, and turned in the salary to the Academy. It is needless to say perhaps that the war between the states was the cause of the demise of the Academy. Of its twelve original members, nine served their country in the army during the years 1861-1865.

When the conflict was over, Morton was dead.

---

*Read before the Ramsey County Medical Society, St. Paul, February 27, 1931.

Braun had gone to Little Falls and Vervais had dropped out, and Rieger was leaving St. Paul. Thus but seven of the original members remained, though Doctor Mattocks was admitted to membership in 1865. The remaining members, feeling that they alone could not carry on, and being unable to determine the ethical and professional status of the new members of the profession who flocked into St. Paul after the war, were placed in a quandary. In addition, their articles of incorporation made them rather a close group and were inelastic enough to meet the situation. So a meeting was called by Dr. Brisbine, who was then president, the laboratory equipment and apparatus sold, the books in the library returned to the donors, and the remaining funds expended on a rather elaborate banquet, and the Academy "liquidated and dissolved." This was in 1866. During the four year period from then until 1870, informal medical meetings were held to which others than those formerly belonging to the Academy were invited. When the present State Medical Association was formed in 1869, the physicians of Ramsey County felt that the time had come to organize again, and the suggestion of Dr. Hand that it be called the Ramsey County Medical Society, prevailed. The status of the physicians of the country was then pretty well known, and our present society was formed on February 14, 1870. Who took the initiative in its formation remains in some doubt. It is certain that the remaining members of the Academy were somewhat apathetic as to starting a new society. The active organizers probably were Drs. Boardman, E. H. Smith and Flagg, urged on by Dr. Willey, who at this time was too far gone with tuberculosis to take an active part in the organization, though he was one of the active organizers of the State Society the year before. The first meeting was held in Dr. E. H. Smith's office, with Dr. Willey acting as temporary chairman until the officers and committee of organization were selected. It may be interesting here to relate the history of the seal of our society. This can best be done by quoting a letter written by Dr. Brewer Mattocks under date of October 3, 1914. Dr. Mattocks is our sole surviving charter member, and we hope will be with us tomorrow. He states: "As to the Seal of the Society, we had none until I was elected to an honorary membership on my return to St. Paul (about 1900) when I was, with the remaining charter members, Drs. Flagg, C. E. Smith and Wharton, appointed to secure the pictures of the charter members. It then occurred to me that we should have a seal, and I suggested the microscope, the pen and the scalpel with the legend dissect, observe and write, in the imperative. I wrote to Bishop Ireland to latinize the motto for me. He was kind enough to send his secretary to me with the suggestion that the imperative be changed to the infinitive, and wrote the legend as it now stands. Drs. Flagg, Smith, and Wharton united with me in presenting this seal to the society, which was graciously accepted as such, and no questions asked from the surviving charter members."

I may say, in addition to this, that the design was drawn by R. O. Sweney. No doubt many of our older members remember Sweney's Drug Store on what used to be called Bridge Square (Third and Wabasha streets).

THE RAMSEY COUNTY MEDICAL SOCIETY'S LIBRARY*

A SHORT HISTORY AND A DISTINGUISHED SERVICE RECORD

H. Longstreet Taylor, M.D., LL.D.
Saint Paul

THE SUBJECT I am to talk about this evening is one that recalls many delightful personal reminiscences, and which I most sincerely hope will please you in the telling.

The library of the Ramsey County Medical Society is now thirty-five years old. It is still growing vigorously, with every promise of a middle age whose service to the local practitioners of medicine should prove to be one of ever increasing usefulness.

We will first consider its birth and infancy, the most important period in the records of every living organism.

" 'Tis fortune gives us birth.
But Jove alone endues the soul with worth."

Dr. Jay Owens in 1883 offered the exchanges of the Northwestern Lancet, of which publication he was editor, to the Ramsey County Medical Society as the nucleus of a library. Unfortunately nothing happened.

At the annual meeting of the Society in January, 1895, the retiring secretary, Dr. H. Longstreet Taylor, made a plea that the Society found a reference medical library, and outlined a plan for its foundation and support.

Dr. A. B. Ancker, presiding, appointed, as a committee to consider the suggestion, Drs. Millard, Renz, Ohage, Foster, and Taylor. After much deliberation it was decided to establish a loan library by providing a room and borrowing reference works from the members of the society, which were to be properly housed, catalogued and made accessible to all searchers after medical truth, and also were to be returned to their owners upon demand. Lest we should forget this last clause, allow me to digress a moment to state that every one of the hundreds of volumes collected in this way is still on our shelves, while, I am sorry to say, very few of the generous lenders are with us today.

A library association was formed, with Drs. Rothrock, Dunning, Eduard Boeckmann, Auten Pine and Taylor as directors. Two rooms were secured for the library and a laboratory in the old Lowry Arcade, which space was given up for quarters in the top of the new Lowry in 1912, when history, as is her wont, repeats once more, and today we move into these palatial quarters in the newest Lowry Building, now known as the Lowry Medical Arts Building.

In the beginning, funds were supplied by the donations of the members, and books and medical journals were solicited on all hands. One of the Board made a practice of spending Saturday afternoons with an express man and his wagon, going to the residence of any physician who would give his permission, and there, with the very willing consent and approval of his wife, would go through the attic or storeroom and cart off everything in the way of medical books and journals that had gradually been crowded off the book case shelves and had finally been consigned with other dust catchers to these regions. These forays often yielded very large dividends, sometimes in unusually valuable books or a first edition, or a rare print, but always in back numbers of periodical literature, which eventually, in combination with donations of others, supplied the missing gaps required to yield complete volumes of the leading medical journals. When these complete volumes finally ran back for five, ten, or even fifteen years and began to fill the sections allotted to them, the triumphant joy of the bibliophilic collector was experienced by the members of the committee. Personally I look back upon the evenings spent with these express wagon loads of treasure, oftentimes in the congenial company of Eduard Boeckmann, sorting over the spoils of the latest raid until the wee small hours. He and I once spent a week-end in the southern part of the state, at the home of a prominent physician, recently deceased, and added a large shipment of Scandinavian literature to the library. We left the house at dusk Sunday evening in a one horse buggy, with Dr. Boeckmann driving. It soon began to rain and grew very dark. It seemed as though we were alone in the thick fog and rain, as no travelers met us, no friendly lights shone from any farm house windows, and that we were doomed to go on forever in that uncomfortable environment. The horse, however, did not agree with the driver as to the whereabouts of our destination. Dr. Boeckmann had apparently laid out a course on one of the great circles, while the horse was equally persistent in an effort to find a shortcut, which was located somewhere within the circle and to our right. The resultant of the action of these two discordant wills was that the buggy wheels would frequently sink in the cultivated soil of a wheat field, for being a grain farming region there were no fences. Then it became necessary to make ever widening circles around the horse and vehicle until the road was once more located. And so it went until at length we came to a farm house, and after much knocking and calling we were finally informed that we had circled around our objective, and, although we had started a dozen miles to the west of it, were now about as far to the east. The first streaks of dawn showed us the way to that long sought habitat of man, and the railroad station.

---

*Read before the Ramsey County Medical Society, Saint Paul, February 27, 1931.

In the fall of 1897 the Society took over the work of the Library Association. Drs. Rothrock, Morley and Taylor, the first committee, were instructed to solicit funds and secure donations and bequests, as well as to supervise the smooth working of the library machinery, with all due diligence.

Urged by the demands of this stalwart young offspring, a period of surprising and rapid development came to the Ramsey County Medical Society. It was very evident that the mounting expenses of the library could not be met by the annual dues from the members, nor by the annual contributions.

Many and various suggestions were made. The one that seemed most promising was that the Society should publish a monthly medical journal. The journal could be exchanged with the great majority of American medical journals, would receive many books from medical publishers for review, and might succeed in selling enough advertising space to make substantial financial contributions to the library. In January, 1898, a committee was appointed to consider this subject from all angles. In the fall of the year the committee not only recommended that the Society publish its own journal, but also endorsed the project, offering to assume any and all financial liabilities that might arise during the first or probationary year. While not so stated, this guarantee was made by Dr. Boeckmann to the other members of the committee in order to insure the adoption of the report by the Society. Such was the wholehearted and generous character of the service he always gave to the Ramsey County Medical Society. He never stopped to count the cost and never asked how much there might be in it for him. In this case he saw that the Society needed funds, he believed the journal would become an important contributor, he knew that many members were afraid of the venture, and in order to insure the adoption of the report he was willing to back it to the finish. He was quite right. The clause carried the report, but by a very narrow margin.

The St. Paul Medical Journal lived through nineteen years. Its publication was suspended when the Minnesota State Medical Association decided to issue its own journal. The Ramsey County Medical Society retired from the field to insure the success of MINNESOTA MEDICINE. The advertising contracts, subscription lists and so forth were turned over to MINNESOTA MEDICINE, which is now thirteen years old.

Dr. Burnside Foster was made editor of the St. Paul Medical Journal, a position he filled most creditably until his death, when Dr. E. T. F. Richards succeeded him.

Dr. Taylor was the business manager for the first ten years, when Dr. J. M. Armstrong succeeded him.

At about this time, when the struggle for the St. Paul Medical Journal was in progress, Dr. Boeckmann donated to the organization his process of making pyoktanin catgut for surgical uses. The workers from his office, who had been trained by him in the long period of experimentation it had required to perfect the product in accordance with his stringent standards, were transferred to the Ramsey County Laboratory and the Society was launched on a commercial project. The manufacture of suturing material for surgical uses was a most appropriate activity for a medical socety to engage in. The laboratory committee from that day to the present time have supervised the sterilization, cleanliness and general safety of the product, which has never been allowed to sag "one jot or tittle" from the high standards set by its originator, and consequently the venture has been crowned with success in every way.

In June, 1899, through the Medical Library Association, Dr. Rothrock reported a gift from Mr. Watkins Seamore of Troy, New York, of his father's valuable medical library of 340 volumes. From exchanges arranged by the Medical Library Association and by personal solicitations a large number of valuable books and entire sets of many journals, both domestic and foreign, were received. These donations came from medical libraries of Boston, New York, Washington, Cincinnati and other centers.

In 1904 the Ramsey County Medical Society, seeing that The Journal and the catgut had both made good, took another forward step by creating a trust fund to be known eventually as the Eduard Boeckmann Library Building Fund, this fund to be used for no other purpose than the erection of a home for the Society, with its various activities.

At the time of the foundation of this fund, Dr. Chas. A. Wheaton put into it a balance of $3,286.85, which he had carefully guarded for several years, while considering the best way to use it in the interest of the medical profession of St. Paul. It was the balance of a fund subscribed by the citizens for the entertainment of the members of the American Medical Association attending the St. Paul meeting in 1901. Dr. Wheaton had offered to refund this sum to the donors, but was told to use it for the medical profession.

This sum and the amount appropriated by the Society amounted to $6,055.62. The St. Paul Medical Journal, in addition to liberal appropriations to the library, added to the building fund the sum of $3,300.00 from 1904 to 1910.

The laboratory has always been a good provider for all the activities of the Society. Its yearly contribution to the building fund has been the backbone of that rapidly growing trust. In addition to this, the rapacious appetite of the library has received a generous slice of the catgut earnings every year, which for the period of 1904 to 1930 amounts to $22,349.00.

Dr. Boeckmann was a staunch believer in the wisdom of owning your own home, and prophesied on every occasion that eventually the society would build its own home from the profits of its suture factory. Although the fund has passed the $200,000 mark, the home he dreamed of is still in the future. The truth of the matter is that such a home should be liberally endowed, to guard against all contingencies.

The owners of the Lowry Medical Arts Building have presented the Ramsey County Medical Society with conveniently arranged and very attractive quarters on a long lease at a nominal rental, a most advantageous arrangement. The building fund should double itself during the duration of this lease.

Having thus outlined the early history of the library and the activities of the Ramsey County Medical Society which nourished it, let us glance at the achievements of a couple of latter-day saints who have contributed much to its career.

The name of Dr. John Milton Armstrong first appears on the library committee early in the twentieth century. His position as manager of the St. Paul Medical Journal gave him an opportunity to look after the interests of the library by safeguarding the continued success of that publication.

His devotion to the library knows no bounds. It has developed his talents as a book collector and has added to them those of an antiquarian interested in early types and the development of surgical instruments.

Dr. Wallace Cole, when president of the society, began the collection of old and interesting surgical instruments and appliances. Three fine cabinets filled with these specimens graced our former quarters and decorate the new one. One of these was presented by Dr. Arnold Schwyzer, one by the Miller Clinic, and one by the Earl Clinic and the St. Paul Clinic conjointly.

Among the rare books Dr. Armstrong has added to the library, two examples are worthy of mention: the Medical Repository, Philadelphia, a medical periodical, of which twenty-three volumes were published beginning in 1797; the Medical and Agricultural Register of 1806, containing the first description of epidemic cerebrospinal meningitis. The library contains also other valuable early American publications.

He is also responsible for the memorial tablets in our entrance hall. Relatives or friends of any deceased member of the society can secure a memorial tablet by making a donation to the library.

Dr. Eduard Boeckmann, our generous benefactor and wise leader, heads the list. The others in this roll of honor and the donors are:

Mrs. Frederick W. Van Slyke, for her deceased husband.

Mrs. E. J. Abbott and Mrs. C. C. Slaymaker, for their father, Dr. John Steele.

Mrs. J. C. Edge, for her husband, Dr. S. D. Flagg.

Mrs. J. W. Willis, for her father, Dr. A. Wharton.

Mrs. C. E. Smith, Sr., and Miss Mary G. Smith, for Dr. F. R. Smith, Dr. Chas. E. Smith, Sr., and Dr. Chas. E. Smith, Jr. (three generations of the family, while a member of the fourth generation, Chas. E. Smith, 3rd, is now taking the pre-medical course at Yale).

Mrs. Theodore Griggs, for her grandfather, Dr. T. R. Potts.

Mrs. F. B. Kellogg and Mrs. F. J. Ottis, for their brother, Dr. Paul B. Cook.

Dr. Harry Ritchie, for his father, Dr. Parks Ritchie.

The other heavenly twin of the latter-day saints is Dr. Frank E. Burch. It was he who succeeded in having the old Medical College Building on Ninth Street deeded to the Ramsey County Medical Society. This very desirable and valuable piece of property is now an integral part of the Boeckmann Library Building Fund.

We have a substantial inheritance from the fathers of the profession in St. Paul, men who were brave enough to begin the teaching of medicine in Minnesota many years ago.

All sciences are in a constant state of flux and change. None more so than medicine. A medical book five years old is proper fruit for the crematory.

With such a rapid deterioration the necessity for new and vigorous growth is very apparent. This explains the instructions that during the gay nineties were given to every library committee. Go forth along the highways and byways and get donations and bequests, for this library of ours is an animal with a voracious appetite and a capacity for rapid growth that must be fed, not with lime salts, but with gold.

The library at the present time has some 13,000 volumes on its shelves, and constitutes an important medical facility of the community, emphasized in the report of the committee on the cost of medical care as essential everywhere.

Miss Isabelle Anderson, A.B., B.S., a medical librarian of much knowledge, tact and experience, is in charge.

Our library books may be consulted by anyone and the medical profession of Minnesota knows that it is always welcome. The services of the attendant, the use of the study alcoves, and the most recent advances in medicine are all here and are to be had for the asking.

THE TREATMENT OF ANAL FISSURES

Harry F. Bayard, M.D.
Minneapolis

THE TREND in treatment of anal fissures veers more and more to a radical type as each individual surgeon studies his results and the basic factors in the recurrent cases. The history of the usual fissure is that of healing and recurrence; in a survey of the pathogenesis and complications the reason for recurrence becomes obvious and I hope to emphasize these factors.

Anal fissures occur in the skin just external to the mucocutaneous junction in the posterior quadrant. It is estimated that 90 or more per cent of fissures occur in the posterior anal quadrant and of the few anterior ones a predominant number will be found in female patients. Mechanical factors explain this predilection of fissures for the posterior quadrant. As the stool is contracted upon by the rectal musculature it is forced caudally with the anterior rectal wall lying almost straight and being rather well immobilized by the prostate in men and the uterus and adnexa in women.

The side walls of the rectum are limited in lateral excursion by the ischii so that as the stool passes down to the anus the posterior quadrant is the only part of the anal circumference in which much stretching may occur. This stretch occurring in the posterior quadrant, together with the curvature of the sacrum forcing the stool with a great deal of power over the posterior commissure, throws the brunt of the trauma in this location and a certain number of lacerations in posterior anal crypts are inevitable, particularly in constipated individuals where the stool is too hard and large. Infection readily occurs in this traumatized anal crypts and as the process is repeated from time to time a fissure is formed. Lymphocytic infiltration and fibrosis occurs in the base and sides of this ulcer, the edge becomes thickened and finally the ulcer heals over only to be reformed by a repetition of this sequence of events.

In such manner is the acute ulcer transformed into the chronic indolent but very painful fissure with the fibrosis and infiltration involving the sphincter, spasm results, and constipation entering the picture as a causative factor also becomes part of the vicous circle. The patient suffering from a fissure postpones passing the stool due to the pain incurred, and the longer he postpones it the more damage does the constipated stool cause. During the course of a fissure frequently a small abscess will form and burrow out under the skin either laterally or posterior to the ulcer. This may rupture back into the ulcer, in which event a blind subcutaneous tract is left, or it may rupture through the skin and leave a tract with an opening through which a probe may be passed to the fissure.

Except in their treatment, anal fissures offer the physician no problem. They are easily accessible for inspection and seldom may be confused with any other pathologic entity. Few conditions as simple as an anal fissure have been honored by the introduction of such a wide variety of remedial agents. Usually the fissure will be found to be associated with an external varicosity which will form an overhanging flap at the external margin of the ulcer, while frequently at the internal margin will be found an hypertrophied anal papilla. These three pathological entities, (1) the external varicosity or so-called sentinel pile, (2) the ulcer itself, and (3) the hypertrophied papilla, make up the typical textbook description of a fissure.

Symptoms of a fissure are rather more diagnostic than are those of most anal or rectal troubles. Recurring attacks of pain with passage of stools and amounts of bright red blood varying from a streak on the stool to a cupful occasionally, make up the patient's complaint. These symptoms will be present intermittently for years or until adequate intervention is provided. In reading over descriptions of fissures the thought impresses me that a superficial abrasion is frequently being mistaken for a fissure. These latter are best left without treatment, other than simple anal cleansing consisting of sponging the anal region gently with a piece of gauze wet with witch-hazel after each stool. There is little question but that some of these abrasions when cauterized will become true fissures. It is obvious that fissure treatment such as caustic, of one kind or another, will produce a favorable result on many of these anal abrasions and prejudice the mind of the physician against more radical treatment.

Palliative measures such as silver nitrate, phenol, the actual cautery, curettage, dilatations, anesthetic ointments and solutions all are accompanied by a high percentage of inevitable failure because they do not rid the patient of all the pathological tissue present.

Palliative treatment does not remove these tracts and recurrence is inevitable if they are left. With these facts in mind wide excision of the ulcer-bearing quadrant of the anus must be the treatment. Sectioning the sphincter is not practiced except where this muscle forms a shelf across the wound preventing free and adequate drainage externally or where the muscle is incorporated in the base of the ulcer densely by infiltration and fibrosis. In case the sphincter is so involved, just enough of the muscle fibers are cut to provide a wound with a flat, clean base which will drain well. Divulsion is not advisable in any case but a mild dilation at times is necessary.

Either low spinal or sacral anesthesia gives excellent relaxation of the anus. While sacral anesthesia is slightly more difficult to accomplish than spinal I feel it is more suitable for most rectal surgery. It is difficult to explain to a patient why, after they have been told they may start walking about after forty-eight hours, they must lie flat in bed when a spinal headache is present. However, under either spinal or sacral anesthesia 100 per cent sphincter relaxation is obtained and contraction found in the anus will be recognized as due to fibrosis and scar tissue rather than muscle spasm. This factor makes regional anesthesia of the greatest help in proctological surgery.

A surgical technic which gives good control of bleeding and is of the simplest kind has been worked out. A plain catgut suture is so placed in the mucosa just above the muco-cutaneous junction that ample length is left on each end of the strand of gut for suturing. Using this suture as a steadying guide, excision of the ulcer is started just external to the suture. The line of excision is carried laterally on each side beyond the thickened skin margin of the ulcer and a wound made which is wide enough so the edges will not approximate when sphincter activity is re-established. No effort is made to keep the wound small, the excision being carried out posteriorly to the point where one is sure the wound will remain open posteriorly after the internal part of the wound is healed. Should examination under anesthesia with a probe reveal a subcutaneous tract, sinus or abscess, the wound margin is carried wide enough to include any such tract.

Mild bleeding may be encountered along the mucosal edge of the incision; a round needle is threaded on the suture already placed in the mucosa and the mucosal edge is sutured along the point where the old muco-cutaneous border existed. This is carried out with each loose end of the suture. In this fashion bleeding is controlled and the suture line acts as a splint to keep the wound edges from drawing together. A small piece of iodoform gauze is laid in the open wound and an inch-wide gutta-percha vent left in the anus.

Last but probably most important of all the steps in the patient's cure comes the matter of postoperative attention. Hot boric packs are kept on the wound from 2:00 p. m. to 10:00 p. m. the day of the operation and as indicated after the first day. The anal drain and the gauze covering the wound are removed after forty-eight hours and the patient told he may be allowed to let his bowels move. Usually this is sufficient; should it not be, a mild laxative may be given the next evening. After each bowel movement irrigation of the anal canal with water at 110°F. through an 18 F catheter is rigidly insisted on. Daily observation of the wound is carried on so that the patient's anal cleanliness may be checked and any appropriate steps taken should healing be advancing in an inadvisable manner. Mechanically washing out the anal canal with a mild antiseptic such as pure witch-hazel at each daily call is good practice. When healing is complete the wound area should present a broad, flat, firm scar which will be found to be firmer than the normal anal margin, thus providing reasonable assurance that recurrence will not take place.

SUMMARY

Diagnosis rests on finding a rather deep ulcer with thickened edges which will usually be in the posterior midline.

Radical excision under sacral anesthesia is demanded because this eliminates recurrences.

420 Medical Arts Building

DIVERTICULITIS OF THE COLON AND SIGMOID—ITS COMPLICATIONS AND TREATMENT*

ARTHUR E. BENJAMIN, M.D.
Minneapolis

THE real significance and surgical importance of diverticulitis of the colon is not generally recognized. It has not received the scientific attention that it deserves.

On account of the inter-relationship of diverticulosis, diverticulitis, and peridiverticulitis of the colon, they are herein jointly discussed under diverticulitis.

Nearly eighty years ago, Cruveilhier[16] described what is now known as diverticulosis of the colon, and Virchow[20] in 1853 gave a clear picture of the disease. Yet, today, the cause is not known, the disease with its complications often overlooked, and the treatment neglected.

HISTORY

Graser[9] in 1898 was probably the first to understand the nature of the inflammation, now termed diverticulitis, which involves the colon. He demonstrated that diverticula occasionally existed in several portions of the colon in one individual at the same time.

Fischer[20] in 1900, Beer[27] in 1904, and Gordinier and Sampson[8] in 1906 published articles on the disease. One of the outstanding early studies of the disease was made by Wilson, Mayo, and Griffin.[26] In this study the pathology was thoroughly analyzed.

In England, Moynihan,[17] and Telling and Gruner[25] published articles giving the X-ray findings in many cases. In France, Patel,[28] Cain, and Hillemand from 1911 to 1913 also contributed much information.

It was not until the X-ray was perfected that diverticulosis was found quite prevalent among the adult population. It was discovered that many of these diverticula caused no trouble until infection occurred, after which the symptoms occasionally became quite pronounced.

Various authors estimate the percentage of individuals suffering from diverticulosis as from 0.5 to 1 per cent, and from 12 to 18 per cent of these patients have diverticulitis. Sharples[21] says in regard to frequency of the disease, "I think, if all the individuals with diverticulitis could be collected together, and then those with appendicitis, it would be found that more have trouble with diverticula than with the appendix."

At the Mayo Clinic,[16] 26,699 X-ray examinations were made, and in 1,574 of these (or 5.89 per cent), diverticula were present. In 1,918 cases of diverticulosis, 653 had active diverticulitis.

Spriggs[22] reports on 158 patients with diverticula. Seventy-six of these were found in the descending colon, thirty in the ascending, thirty-one in the transverse portion, twenty-three in the whole colon, seven in the cecum, and four in the rectum.

In reviewing these tabulated cases, one is struck with the report of the sudden death or short period of illness of some patients. Several of these were due to peritonitis.

Spriggs and Marxner[24] found 10 per cent, in their patients examined by X-ray, showing diverticulosis.

Gordinier and Sampson[8] reported diverticula of the large intestine in sixty-four out of 8,132 autopsies in Dresden, nineteen out of 2,600 at Johns Hopkins, two out of 953 in the Bender Hygienic Laboratory, and one out of 2,382 in the Boston City Hospital. I am sure modern statistics will show a much larger proportion.

de Quervain[6] says that in a number of cases diverticula are merely postmortem findings without clinical manifestations and are often missed in the first stages at the ordinary pathological examination. At operations, they are passed by as innocent ordinary adhesions and unrecognized as diverticulitis.

CLASSIFICATION

Spriggs,[23] Case,[4] Rankin and Brown,[20] Mayo,[16] and Mailer[15] have offered various classifications of the disease according to stages, symptoms, complications, and so forth.

Inasmuch as diverticulosis, diverticulitis, and peridiverticulitis are the various stages of the same disease and may be present in the same individual at one time, a classification like the following seems sufficiently comprehensive:

---

*Read before the Western Surgical Association, Kansas City, Dec. 5, 1930.

1. Spastic colitis or prediverticulosis stage.
    a. With stasis.
2. Diverticulosis
    a. Simple
    b. With fecaliths
3. Diverticulitis
    a. Simple
    b. Ulcerative with hemorrhages
    c. With hyperplasia and stenosis
    d. With infection
    e. Perforating
    f. With malignancy
4. Peridiverticulitis
    a. With adhesions
    b. Acute obstruction
    c. With abscess
    d. With peritonitis
    e. With complications, fistula
    f. With malignancy

John F. Erdmann[7] and C. D. Overton[19] believe, from clinical experience, that the cause is congenital, as they have found protrusions along the whole alimentary tract from the esophagus to the rectum.

Pieth, Patterson, Graser, Schreiber, Wilson, and many others believe that weak areas occur in certain portions of the colon preceding diverticulosis.

E. T. Bell[2] believes that congenital weakness of the muscle walls and manner of blood supply are causative factors.

C. D. Harrington[11] reports a case where a diverticulum protruded into the pelvis from the rectum back of the uterus.

Between the mesenteric and lateral muscle bands, the blood vessels penetrate the inner circular muscular fibers to enter the submucosa just before they reach the longitudinal bands on either side of the colon, constituting weak places in the bowel wall (Fig. 1). The fat epiploic appendages lie between the longitudinal bands laterally, and into these the hernia forces its way along the blood vessel entering the tag. The diverticulum is often concealed by these fatty tags.

W. D. Haines[10] calls attention to the fact that the upper portion of the sigmoid has a short mesentery and is covered with peritoneum only on the anterior and lateral surfaces in 90 per cent of cases.

Age has much to do with the production of diverticulitis, as most individuals suffering with the disease are found to be above forty-five. The disease is probably more prevalent in persons around fifty or beyond. At this time in life, individuals follow more sedentary habits, and, consequently, the peristaltic action of the intestine is less vigorous and the muscle tone is generally less positive. A sclerosis of the vessels referred to above is a potential cause.

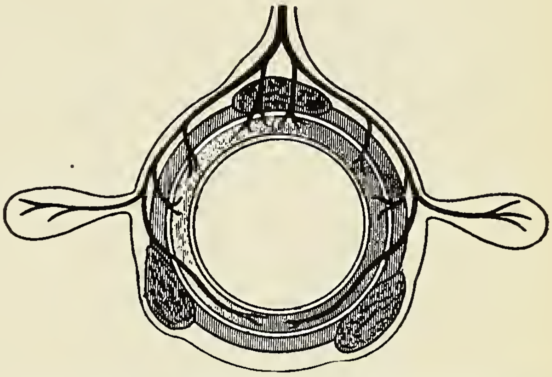


Fig. 1. Drawing showing where the muscular coat is pierced by the blood vessels from the mesentery, constituting the seat of election for diverticula (after Drummond). From Robert Mailer, The Lancet, July 14, 1928.

Robert Mailer[15] gives the following age and sex incidence:

In 100 cases of diverticulitis

Age	M	F	Age	M	F
20 to 30	0	1	50 to 60	25	11
30 to 40	6	4	60 to 70	19	5
40 to 50	17	8	70 to 80	3	1

John W. Keefe[14] states, "Diverticula occur twice as often in males as in females, and 60 per cent of diverticula have serious sequelæ." My own cases show about an equal number of diverticula in both sexes.

The anatomical arrangement of the colon, and its physiological function in which there is a slowing up of the contents of the bowel, leads to a stagnation in certain areas. Especially is this noticeable in the sigmoid, where the content becomes more firm, causing pressure and lowered vitality of the tissue.

A. C. Jordan[12] states that colitis is one of the most common causes of diverticula. On the other hand, Case[4] is of the opinion that colitis is the result rather than the cause of diverticulitis. It is reasonable to suppose that a colitis might lessen the resistance of vulnerable points in the colon and predispose the areas to diverticulosis.

Constipation is believed to be an important factor in diverticulitis.[26] Hardened fecal materials produce ulceration, and it is believed that the sigmoid, therefore, is the most commonly affected.

Perhaps the character of the food of humans, the mode of living, and habits have much to do with the cause of diverticulitis. Coarse foods do aggravate it. A reasonable amount of outdoor exercise, such as golf, is beneficial in the early stages.

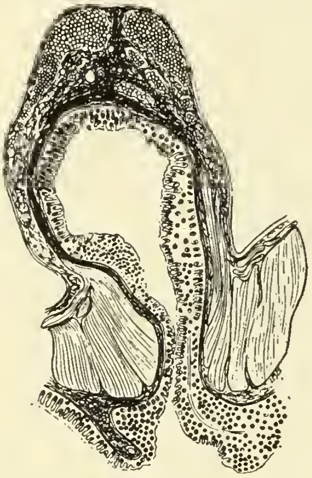


Fig. 2. The same as Figure 1.

Dr. C. P. Fitch, Chief of the Division of Veterinary Medicine, University of Minnesota Agricultural College, reports in a special communication that diverticula are occasionally encountered in the large bowel and colon of the horse due to hard balls of feces. They are found less often in cattle, but occasionally in dogs, due to pressure of a foreign body.

SYMPTOMS

Some of the following symptoms are present in each case of diverticulitis. A typical case may experience most of them up to the serious or complicating stage.

1. Increasing disturbances from gas in the intestine.
2. General abdominal distress and pain.
3. Constipation.
4. Pain in left iliac region.
5. Bladder discomfort and frequency.
6. Occasional diarrhea.
7. Nausea and vomiting.
8. Pain in rectum.
9. Passage of blood.
10. Gradual loss of weight.
11. Acute attacks of pain with fever and chills.
12. Acute obstructive symptoms.
13. Acute perforative symptoms.

Pain and tenderness may be general when several diverticula along the colon become inflamed.

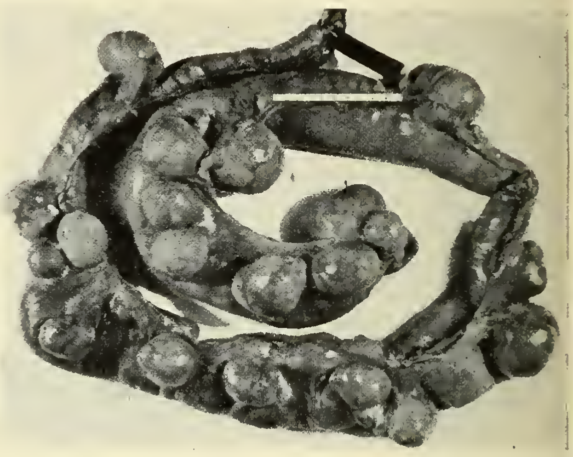


Fig. 3. Multiple diverticula of the colon. From Dr. E. T. Bell's Textbook on Pathology.

Localized soreness with a palpable mass is often confined to the sigmoid. The temperature, pulse, and leukocyte count usually rise in acute attacks, and the symptoms are occasionally mistaken for an attack of acute appendicitis.

Where a peridiverticulitis has occurred, obstructive symptoms not infrequently supervene and, when there is a history of declining health and the passage of some blood, cancer is often suspected.

Judd and Pollock[13] observed blood in 18 per cent of cases of diverticulitis and 47 per cent of those of carcinoma.

Carcinoma may be present in the same case with diverticulitis. Mayo[16] reports 15 per cent present. Ballin[1] is of the opinion that carcinoma may follow diverticulitis. Therefore, a suitable operation should be performed if carcinoma is suspected.

Rankin and Brown[20] report, out of a series of 227 cases of diverticulitis, only four associated cancer cases, and in 679 cancer operative cases, diverticulosis was found in four only.

DIAGNOSIS AND COMPLICATIONS

Before the advent of the X-ray, the profession made little headway in the diagnosis of diverticulitis. Many diverticula are missed today due to their position, or to their orifices being occluded or too small for the barium to enter. Owing to careless or imperfect technic, or lack of knowledge and experience of the technicians or interpreters, a negative report may be given. Diverticula may retain the barium many days, demonstrating how long enteroliths may remain in some diverticula. Case[14] reports one individual who had multiple diverticula which were still filled on the sixteenth day. Others reported even longer periods.

Perhaps the disease which is most frequently confused with diverticulitis is acute appendicitis. A periappendicular inflammation due to an adherent infected diverticulum can easily be mistaken for an ordinary appendicitis.

A cystitis has led many clinicians astray. They have not always recognized the cause as arising from an abscess of a diverticulum and bladder infection therefrom. Likewise, prostatic symptoms in the male as well as bladder pressure and discomfort in both sexes can originate in a diverticulitis of the sigmoid. A tumor in the left pelvis in the female does not often lead the ordinary practitioner to seek its origin in an inflammation of the sigmoid. No doubt, some are operated upon and an adherent tube or ovary is removed with the diagnosis of salpingo-oöphoritis.

An attack of diverticulitis may be mistaken for a volvulus or vice versa. Pancreatitis, gallbladder disease, intussusception, or tuberculous peritonitis can be confused with diverticulitis. So-called abdominal adhesions are operated upon as frequently as any other condition without the knowledge that they may be nature's barrier preventing a perforating diverticulum from infecting the peritoneal cavity.

Old abscesses, originating from perforating diverticulitis where pus has traveled to remote corners of the abdomen and opened elsewhere, may be very difficult to trace. Backache, sacro-iliac discomfort, and many unfathomed neuralgias and pains may, in the future, be traceable to diverticulitis in some cases. An ischiorectal abscess unquestionably is frequently due to diverticulitis of the lower sigmoid or rectum.

TREATMENT AND PREVENTION

It is probable that fewer cases of diverticulosis and diverticulitis will develop in the future on account of the careful supervision of diet habits of children by the pediatrician.

A case of diverticulitis should constantly be kept under observation and treated to avoid the inflammatory stage, if possible. Perhaps the selection of proper diet, colon irrigations, and olive or mineral oils may assist in preventing diverticulitis. Exercises in which the abdominal muscles massage the intestines are beneficial in assisting the diverticula to empty, and favoring regular normal evacuations.

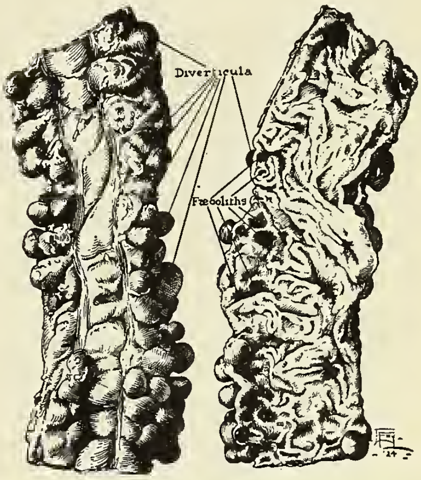


Fig. 4. Multiple diverticula of the descending colon filled with feces. From Rankin and Brown's article on "Diverticulitis of the Colon," S., G. & O., April, 1930.

When a surgeon is confronted with symptoms of impending perforations, peritonitis or obstruction, it is his duty to institute surgical relief early. A late operation may be unsatisfactory, imperfect, or useless. When the operation is performed early, before the patient is in a serious general condition, the diverticula may be inverted, the region drained, or the bowel resected, perhaps with satisfactory results or without serious consequences. A preliminary colostomy in severe obstructive cases is the operation of choice, and this may be done by bringing the descending colon, above the obstruction, partly out through the abdominal wall, passing a fascial strip through the mesentery for support. Later, when the patient is in good condition, the bowel may be resected, unless the infection and obstruction disappear. The bowel may then be replaced within the abdomen by cutting the fascial strip, separating it from the wall, and allowing it to drop back. The colostomy can be closed later. A side anastomosis can be performed, if preferred, excluding the obstructed area, and, by leaving the colostomy open temporarily, undue tension on the enterostomy stitches is prevented.

On account of the frequency of carcinoma associated with diverticulitis, resection should be performed in suspicious cases, even though the obstruction may not be complete.

Overton[19] states that we may expect 90 per cent cures in diverticulitis by early expert surgery.

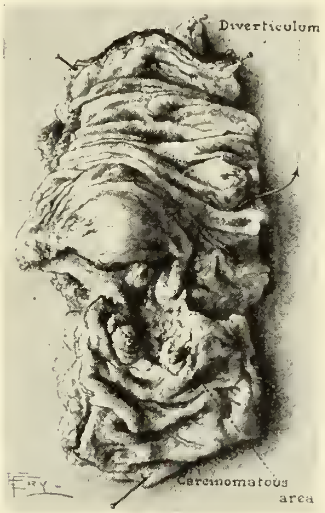


Fig. 5. Carcinoma of the colon developing in the presence of a diverticulum. From Rankin and Brown's article on "Diverticulitis of the Colon," S., G. & O., April, 1930.

Bensaude and Hillemand[3] prefer a colostomy if a removal of the mass is impossible.

Gerzowitsch gives a mortality of 12 per cent in a series of sixty-one cases resected.

When the disease is confined to a known area or section, resection is the choice where possible, but a resection performed when other nearby tissue harbors diverticula that are infected courts disaster. A colostomy may save the patient and permit a later safe radical curative operation.

CONCLUSIONS

1. As a possible focus of infection, diverticulitis is often overlooked.
2. The location and direction of the lateral blood vessels of the colon and sclerosis of these vessels may predispose to herniation.
3. Congenital weakness or defects in the colon wall are recognized possibilities.
4. Age, obesity, and sedentary habits may favor the development of diverticula.
5. Improper habits and unsuitable food may account for their unusual frequency in humans as compared with that of other animals.
6. Symptoms caused by diverticula are misleading and sometimes attributed merely to indiscretion in diet.
7. The diagnosis can and should be made early, by means of an X-ray examination.
8. Treatment should be directed toward preventing further progress of the disease when possible.
9. Operations for diverticulitis and its complications include some of the most formidable surgical procedures known. Experience, judgment, and skill are necessary to obtain the maximum results.

The following will illustrate a few of the cases of diverticulitis that are encountered, some with severe and acute symptoms as well as complications.

CASE REPORTS

Case 1.—Perforation of Diverticulum and Sudden Death.

Mr. O., a widower, aged 68, and a laborer, had complained for some time of gas and occasional pain in the lower left abdomen. While going to work one morning he was seized with pain in the lower abdomen. He dropped to the ground as though shot and was picked up in a very weak condition. When he arrived at the hospital he was pale, had an irregular and weak pulse, and was in shock. He showed evidence of some acute abdominal condition.

He was given stimulants and hypodermoclysis, and was operated upon. We found a perforation of a diverticulum of the sigmoid with the contents of the bowel in the pelvis. He gradually failed and died the next day, apparently from the effect of shock.

This case demonstrates the serious consequences that may arise in a case of diverticulitis.

Case 2.—Diverticulitis with Infection, Obstruction, Abscess and Pelvic Peritonitis and Pneumonia.

L. A. L., a male, aged 57, had been sickly as a child but quite well after the age of twenty, except for attacks of tonsillitis. He had a small left hernia repaired in 1915 and had had an attack of sciatica in 1919. He states that he has had some prostatic trouble of late and used to have considerable backache when younger. He has had pain in his right side and back for a month and an acute sciatica and backache for over two weeks.

The patient was taken suddenly ill on the morning of January 10, 1922, with pain in the left inguinal region, the pain radiating upward with some general abdominal discomfort, considerable nausea, retching and vomiting. The patient became very restless and extremely thirsty. Temperature ranged from normal to 99.2. The pain became less in the afternoon and his temperature became normal. The leukocyte count ranged from 13,000 to 17,000 the first two days in the hospital. His bowels moved on the first day after an oil enema and later after a low modified *Noble's* enema. The evening of the next day he became worse, with increased pain and vomiting. The abdomen was somewhat distended, and a mass with dullness was present above Poupart's ligament on the left. On account of the increased severity of the symptoms and suffering, an operation was performed on the second evening.

A left rectus incision was made under local anesthesia. A mass of adhesions was present around the sigmoid with marked diverticulitis. Numerous diverticula containing fecal concretions were found. The lymphatics were enlarged. Some of the fecaliths were forced back into the bowel through the openings, and the diverticula ligated. Owing to the extensive involvement of the bowel, resection was thought inadvisable. A Penrose drain was placed in the region of these adhesions.

The patient progressed satisfactorily for a few days. He had some hiccoughing and vomited occasionally. Gastric lavages relieved the vomiting. His abdomen became less distended and he was able to retain some nourishment. There was more or less drainage from the wound. He, however, developed an obstruction later necessitating a colostomy, which improved his condition somewhat. A bronchial pneumonia supervened, however, and he died, February 1, twenty days after the acute abdominal symptoms began.

Case 3.—Diverticulitis with Diseased Thyroids, Fibroid Uterus.

Mrs. A. R. P., aged 53, had had a radical operation for cancer of the left breast in 1911. Ligation of the inferior and superior poles of the thyroid had been done in 1911. The patient had been very nervous and had had more or less pain in the left abdomen, but no nausea or vomiting. There had been some diarrhea at times; dysuria and disturbed vision.

Examination showed the thyroid, especially in the region of the isthmus, markedly enlarged. There were fibroids of the uterus with retroversion. A few hemorrhoids were present.

On account of toxic symptoms, a thyroidectomy was performed and five-sixths of the thyroid lobes was removed. Progress was satisfactory as far as the thyroidectomy was concerned, but the patient still continued to have pain and abdominal distress.

X-ray examination showed several diverticula in the descending colon and sigmoid. There was no evidence of diverticulitis, obstruction or new growth at this time, but a prolapse of the transverse colon was evident.

The uterus was enlarged to twice its normal size, retroverted and contained fibroids. The appendix was retrocecal and fixed. An appendectomy and a supravaginal hysterectomy were performed.

The patient made a satisfactory recovery from the operation but still complains of constipation and abdominal distress. The bowels move every other day, but she has some abdominal distress and distention if she is not careful about her diet or eats too much. She gets tired and nervous at times, but looks much better. She is more energetic, has a better color, and has gained slightly in weight. We do not expect this patient to become perfectly well, but care in her diet should prevent her diverticulitis from growing progressively worse.

Case 4.—Acute Bowel Obstruction from Diverticulitis.

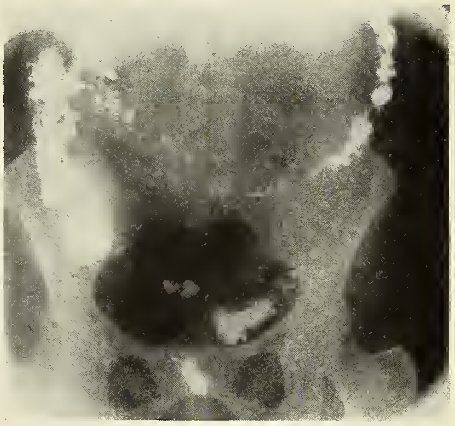


Fig. 6. X-ray of colon (Case 5) showing multiple diverticula.

Miss D. C., aged 42, had always had good health until a month previous to examination, when she began to be troubled with extreme constipation and marked abdominal distention, followed by nausea and vomiting and symptoms of acute obstruction.

At operation, some adhesions were found around the gallbladder. The cecum, ascending and transverse colon were greatly dilated and complete obstruction was found at the lower portion of the descending colon, annular in type. The descending colon was separated and a loop brought up into the wound. It was anchored to the peritoneum and a fascial strip passed through the mesentery of the bowel for support. A tube was stitched into the bowel. Microscopic examination of tissue removed showed no cancer, but an acute inflammation from diverticulitis, with ulceration.

Progress was satisfactory excepting that the blood supply was somewhat interfered with. About two inches of the obstructing portion sloughed and a considerable drainage occurred. The obstructing and sloughing area was removed by cautery at a later date.

A second operation was performed to unite the lower and upper rectal colon. Many adhesions were separated and a side anastomosis of the distal and proximal portions of the colon was made. The former opening was left for a vent.

Since that time there has been some drainage and a few fistulæ, originating from the site of the anastomosis. She now has a small fistula and there is a little fecal discharge occasionally from the colostomy opening, but she has a normal bowel movement daily. The remaining fistula can be closed as soon as the inflammatory trouble disappears and the tissues are in condition for the repair work.

Case 5.—Multiple Diverticula of Colon with Perirectal Abscess.

Mrs. B., aged 63, a nurse, had suffered from gastrointestinal disturbance for years. Diverticula were discovered about fourteen years previous (Fig. 6). She has had marked constipation, considerable dysuria and frequent micturition, occasionally passing some blood from the bowel. She had had perirectal abscesses in 1927 and fissures for some time. The abscess was apparently due to diverticula of the rectum. She was operated on in 1927 with drainage and good recovery. Hypertension has existed for a number of years.

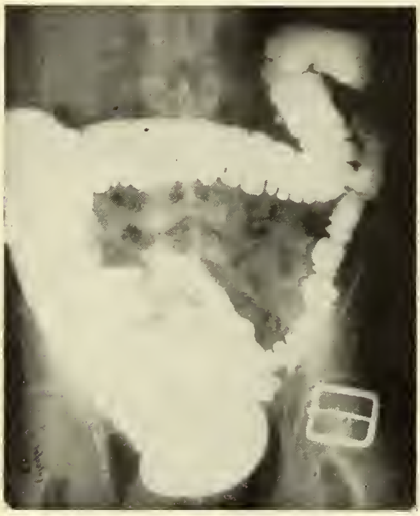


Fig. 7. X-ray of colon (Case 7) showing diverticulitis of the transverse colon and spasticity.

Gastrointestinal symptoms have become considerably less and she is in fairly good general health. She has no trouble with the rectum. She has lost about fifteen pounds in weight during the last five years. Hypertension is still present.

Case 6.—Diagnosis of Cancerous Growth in Pelvis, but Probably Due to Diverticulitis.

L. H., a housewife, aged 71, had suffered from extreme constipation, gradual loss of weight, nausea and vomiting. Her weight was about eighty-seven pounds and her previous attendant had diagnosed cancer in the pelvis.

Upon examination the colon was found to be greatly dilated, giving the impression of a cyst in the pelvis. There was a prolapse of the uterus with some cystocele and rectocele. A tympanitic note was present over the cecum, transverse and upper portion of the descending colon. No solid mass was found in the pelvis but there was a slight dull area in the region of the sigmoid. The urine showed a trace of albumin and sugar, and clumps of pus cells. The hemoglobin was 75 per cent. X-ray showed an enormous dilatation of the entire colon as far as the sigmoid. A barium enema was not retained because of obstruction in the upper part of the rectum. Examination by sigmoidoscope showed no ulceration or growth.

On August 1, 1930, under local anesthesia, a colostomy was done, bringing a loop of the descending colon up and out of the abdomen, using a fascial strip through the mesentery of the colon for support, and inserting a rubber tube into the colon through which frequent irrigations were done to empty the colon and reduce its size. The colon above the obstruction was greatly dilated. A small mass in the region of the sigmoid, due to inflammatory trouble in and around the sigmoid, like a diverticulitis and not like cancer, was found. A specimen removed failed to show carcinoma. The patient began to improve, and gained in weight and strength. The colostomy opening functioned perfectly. She is up and about, able to wait on herself, get her own meals, and seems quite well generally. The colon is reduced two-thirds in size so that the tympanitic note has disappeared. The abdomen remains flat. The bowels frequently move normally.

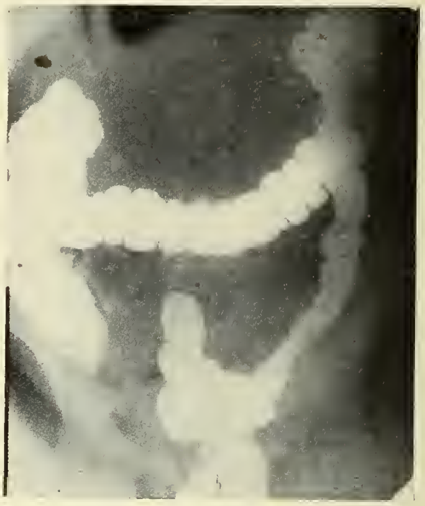


Fig. 8. X-ray of colon (Case 9) showing narrowing due to peridiverticulitis.

Case 7.—Diverticulitis with Chronic Indigestion.

Mr. D. C., aged 58, has had indigestion, belching of gas, constipation, abdominal distention and soreness along the transverse and descending colon for a number of years. He has passed some blood occasionally.

X-ray showed diverticulosis and diverticulitis of the transverse colon and sigmoid (Fig. 7).

Special diet, mineral oil, oil enemata, bowel flushing, and moderate exercises have lessened the distressing symptoms and resulted in much improvement. He passes little or no blood now but has moderate distress in the abdomen at times.

Case 8.—Possible Diverticulosis.

C. J. D., aged 47, a bond salesman, weighed 190 pounds and was 5 feet, 9 inches tall. He had had a double herniotomy in 1910, and tonsillectomy and adenoidectomy in 1918. He had also had influenza and the usual children's diseases. He has had more or less gastrointestinal disturbance, with pain in the region of the appendix.

In November, 1929, he had an attack of appendicitis and was operated upon. Previous to that time he had

had some trouble with flatus, hyperacidity of stomach, and some nausea. Several adhesions in the lower left abdomen were found at operation.

A barium enema before appendectomy showed several diverticula in the pelvic colon and some spasm of the tip of the cecum. The urine showed a heavy trace of albumin, and a large trace of sugar, but this disappeared while he was in the hospital. In February, 1930, he had an acute cold, a leukocyte count of 10,500, and a trace of albumin in urine. About this time he began to have more or less dizziness, bloated abdomen, and some headache. Diet, bowel flushes, oil enemas, etc., caused gradual improvement.

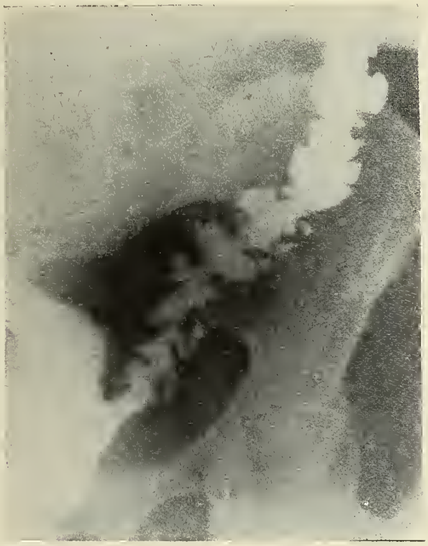


Fig. 9. X-ray showing multiple diverticula of the descending colon without symptoms.

At present he is feeling very well, the dizziness has about disappeared, except when lying on his back.

Case 9.—Diverticulitis and Peridiverticulitis.

H. L., age 68, a female, gave a history of hemorrhoids, abdominal distress, with pain, general discomfort and constipation, dysuria, and pain in the back. In 1925 the hemorrhoids were removed. Later a proctoscopic examination revealed some redness and inflammation in the upper part of the rectum, from which area there was slight bleeding.

X-ray revealed diverticula of the sigmoid and lower portion of the descending colon (Fig. 8). There was an inflammatory exudate in these areas, partly constricting the colon. The patient progressively grew worse and developed obstructive symptoms.

On February 6, 1929, a laparotomy was performed. The sigmoid was entirely involved and almost completely obstructed, the descending colon fixed by numerous adhesions. A colostomy was done above the obstructed area. A fascial strip was passed through the mesentery of colon for support, a Penrose drain placed in the region of the infected diverticula and a tube was stitched into the colon. The patient progressed favorably, but developed an abscess which extended to the right side of the abdomen, and was later opened and drained. The gallbladder was very much enlarged and adhesions were pronounced in that region. Bladder symptoms were quite aggravated during all this time and considerable pus was found in the urine. Cystoscopic examination showed a definite cystitis.

Convalescence was rather stormy but gradually the patient improved and with the exception of a somewhat narrowed colostomy opening and a post-operative hernia she is in fairly good health. She occasionally has some fecal passages per rectum. All inflammatory trouble seems to have disappeared, as well as the bladder discomfort.

BIBLIOGRAPHY

1. Ballin, M.: Diverticulitis of the colon. Amer. Jour. Surg., 1927, ii, 130-141.
2. Bell, E. T. (Prof. of Path., Univ. of Minn.): Textbook on Pathology. Pp. 478. Lea & Febiger, Philadelphia.
3. Bensaude, R., and Hillemand, P.: Diverticula of the sigmoid. Gaz. Med. de France, Par. 2, 165-169, April, 1928.
4. Case, James T.: Diagnosis and treatment of colonic diverticula. Amer. Jour. Surg., iv, June, 1928.
5. Case, James T.: The roentgen study of colonic diverticula. Amer. Jour. Roent., xxi, March, 1929.
6. de Quervain, F.: Diverticulosis and diverticulitis of the large intestine. The practitioner, 118:352—36, June, 1927.
7. Erdman, John F.: Diverticulitis of the colon. Amer. Jour. of Obstet and Gynec., 11:609-616, May, 1926.
8. Gordinier and Sampson: Diverticulitis causing intestinal obstruction. Jour. A. M. A., May 26, 1906, xlvi, 1585-91.
9. Graser: False diverticula in the sigmoid flexure. München Med. Wchnschr., 1899, xxii, 721.
10. Haines, W. D.: Diverticulitis of the sigmoid. Jour. Med., 8:377, October, 1927.
11. Harrington, C. D.: Congenital diverticulum of the rectum. Northwestern Lancet, 1920.
12. Jordan, A. C.: Discussion on diverticulitis. Proc. Roy. Soc. Med., 1920, xiii, Sec. of Surg.
13. Judd, E. S., and Pollock, L. W.: Diverticulitis of the colon. Ann. of Surg., 1924, lxxx, 425.
14. Keefe, John W.: Diverticulitis of the sigmoid or pelvic colon with sigmoid vesical fistula. Boston Med. and Surg. Jour., April, 1926.
15. Mailer, Robert: Diverticula of the colon, a pathological and clinical study. Lancet, July 14, 1928.
16. Mayo, Wm. J.: Diverticulitis of the sigmoid. Brit. Med. Jour., Sept. 28, 1929, No. 3586.
17. Moynihan: The mimicking of malignant disease in the large intestine. Edin. Med. Jour., 1907, xxxi, 228.
18. Newton, Francis C.: Acquired diverticula of the colon. Arch. of Surg., Vol. 18, Part 2, pp. 1339-1358.
19. Overton, C. D.: Diverticulosis of the large bowel. Med. Clin. of No. Am., 11:1361-1370, March, 1928.

20. Rankin, Fred W., and Brown, Phillip W.: Diverticulitis of the colon. Surg., Gynec. and Obstet., May, 1930, i, 836-839.
21. Sharples, Caspar W.: Diverticulitis of the sigmoid. The Jour. Lancet, 46:500-503, Nov., 1926.
22. Spriggs, Edmund I.: Proc. Royal Society of Med., Subsection Proctology, Feb. 9, 1927.
23. Spriggs, Edmund I.: Diverticulitis. Brit. Med. Jour., Sept. 28, 1928.
24. Spriggs, Edmund I., and Marxer, O. A.: Intestinal diverticula. Quart. Jour. Med., 1925, xix, 1-34; Multiple diverticula of the colon, Lancet, 1927, i, 1067-1074.
25. Telling and Gruner: Brit. Jour. Surg., 1916-17, Vol. 4, p. 468.
26. Wilson, L. B., Mayo, W. J., and Griffin, H. Z.: Acquired Diverticulitis of the large intestine. Surg., Gynec. & Obstet., 5:8-15, 1907.
27. Beer, Edwin: Some pathological and clinical aspects of acquired (false) diverticula of the intestine. Am. Jour. Med. Sci. 128:135, July, 1904.
28. Patel: Une observation de sigmoidete herniaire diverticulite sigmoidienne. Rev. de Med. 1911.

THE WHOOPING COUGH PROBLEM*

L. W. Sauer, M.D., Evanston, Illinois: The etiology, the mode of dissemination, and the laboratory diagnosis of whooping cough are well established. It is the most prevalent communicable disease of early childhood, mainly because it is customary to procrastinate about diagnosis and quarantine until the whoop has developed. As in measles, the most contagious period is the catarrhal stage, that is, before the clinical symptoms are typical. To make an earlier diagnosis mother and physician must become "whooping cough minded." The cough plate of Chievitz and Meyer is comparable to the culture for the diagnosis of diphtheria. The plate must be exposed relatively early and must be well coughed on; it requires three or fours days' incubation. Patients do not always exhale pertussis bacilli. A child may have typical paroxysms without expelling pertussis bacilli on the plate. It is best to expose plates in duplicate. A negative plate does not exclude pertussis.

Leukocytosis, especially lymphocytosis, characterizes the spasmodic stage, but is usually absent early in the catarrhal stage. The earlier in the course of the disease, the less characteristic the cough, and the lower the blood count, but the more likely will the cough plate be positive; the farther along the disease, the more typical the cough, and the higher the count, but the less likely will pertussis bacilli be isolated. The mortality rate is 1 per cent of the cases for all ages; it is 33 per cent of the cases when computed for infants aged less than one year.

Fresh, not cold air, proper food and aseptic nursing care are essential; quinine, phenobarbital and ether by rectum are valuable adjuncts which help give symptomatic relief. Vaccine, as used at present, is of doubtful therapeutic value.

---

*Abstract of paper presented before the meeting of the Northwest Pediatric Society, Rochester, Minnesota, July 11, 1931. Taken from Proceedings of the Staff Meetings of the Mayo Clinic, July 8, 1931.

A PROPOSAL OF WHOLESALE PASSIVE IMMUNIZATION AGAINST POLIOMYELITIS EPIDEMICS*

J. Charnley McKinley, M.D., Ph.D.
Minneapolis

The writer feels some trepidation in putting the following suggestion into print because he has developed his point of view only through apparently logical deductions from premises which have not been sufficiently clearly demonstrated to permit classing them as established facts. It must not be thought, therefore, that wholesale passive immunization will surely be even a partially suitable weapon against poliomyelitis. But the ineffectiveness of our present attempts to stop the spread of epidemics of this disease is sufficient excuse for a presentation of this sort, and justifies the advocacy of any reasonably promising public health procedure, provided that the measure is not prohibitively expensive of time and money, and provided that it will conceivably do no harm. This paper then is nothing more than a plea for the trial of an experiment that might work as desired.

After the writer's own ideas were well systematized previously to writing this paper, he found a short article by Moro,[1] with essentially the same proposal as is here presented. Also, during the preparation of the manuscript, a paper by Flexner[2] appeared, in which he dwells in a few paragraphs on the possibly desirable effect of the same means of attack as is here outlined.

Let us consider the premises on which this proposal is based. The first four are the result of long series of investigations, both experimental and clinical. They have been discussed repeatedly in the various monographs on poliomyelitis; hence no attempt will be made in this paper to give credit where credit is due. The fifth one revolves about the recent experimental work of American investigators, which is especially significant, and will receive special treatment. The premises follow:

1. The usual incubation period of poliomyelitis varies between four or five to eight or nine days. In a series of about 200 cases of monkey poliomyelitis induced experimentally in previously untreated animals at the University of Minnesota, the longest time interval was 22 days. Incubation periods of more than two weeks in our experimental animals have been rather exceptional.

2. An attack of poliomyelitis confers regularly a strong, lasting immunity. The extreme rarity of two attacks in the same individual is evidence for this point. Further, it is difficult to produce the disease in a monkey that has recovered from a previous attack.

3. The blood serum from a person or monkey that has had a previous attack of poliomyelitis will inactivate the virus. If such an immune serum and a potent virus are mixed in the test tube and a portion of this mixture is injected cerebrally into a monkey, the animal either will develop no poliomyelitis, will have a light attack, or will develop the disease only after an abnormally prolonged incubation period.

4. The blood serum from a person or monkey recovered from a previous attack apparently contains antibodies which will produce passive immunity in another animal. Thus, if this immune serum is injected into a susceptible monkey and then, within a few hours or days of time, the animal is inoculated cerebrally with active virus, the animal will be partially or completely protected against the inoculation. The length of time this passive immunity lasts is not known. An experiment is already under way for the elucidation of this point in the writer's laboratory. By analogy with other conditions in which passive immunity can be produced, this period probably extends other several weeks of time; it would thus be expected that the period will be found at least as long as, or likely longer than, the incubation period of the disease.

5. Aycock and Kramer,[3] Shaughnessy, Harmon and Gordon[4] and Schultz and Gebhardt[5] have tested the serums of normal individuals who give no history of a recognizable attack of poliomyelitis. The method of testing was to draw blood from these persons and discover whether this blood would neutralize virus *in vitro* as stated in premise three above. Neutralization

---

*From the Division of Nervous and Mental Diseases, University of Minnesota Medical School, Minneapolis.

was taken as evidence of immunity. Their work tends to show that seventy-five or eighty per cent of adults living in the larger urban communities possess blood serum with relatively large amounts of poliomyelitis antibodies and that these people are apparently actively immune to the disease. In the rural communities the immunes constitute probably half of the adult population. The assumption has been made that these normal immune adults have acquired their immunity by one or more contacts with the virus which, for some unknown reason, resulted in immunization, rather than in an attack of the disease.

The experiments of these students of poliomyelitis have to do with a number of cases which is altogether too small for definite conclusions statistically. But their work is strongly supported by the fact that relatively few persons are attacked by the disease after adolescence, and as the age grouping is increased after the first decade, the incidence of the disease rapidly decreases. In the great New York epidemic of 1916,[6] for example, 95 per cent of the cases occurred during the first decade and only 0.3 per cent of the cases occurred after forty years of age. Hence, it is extremely probable that the vast majority of normal urban adults and a somewhat smaller number of those in the country are immune in the same way that recovered cases are immune. The normal adults in a community thus constitute a large reservoir of antipoliomyelitic serum.

The problem then becomes one of making use of this reservoir. It is impractical to test these people individually to determine which ones are immune because of the necessity of using monkeys for the biological test and the extreme expense that would be involved in the large number of animals required. One hesitates to use serum picked at random from unselected adults for the specific treatment of a diagnosed case of the disease because of the chance that the donor's blood might come from the non-immune group. One does not care to gamble with percentages in such a case; and this is usually not necessary because there are nearly always enough recovered cases in a community or individuals who have previously been definitely in contact with poliomyelitis to permit their selection as donors for the developing cases that need immune serum treatment. But for a prophylactic public health measure we are entirely justified in working with percentages because it is well known that epidemics, of smallpox, for instance, can be brought under control by measures which make no pretense of building up resistance in one hundred per cent of the population.

Suppose, then, that in the presence of a beginning epidemic in a city, we were to take blood at random from the adult population and inject it in proper amounts into the members of the most susceptible age groups, that is, into children from one to twelve or thirteen years of age. The goal would be to inject as many susceptibles as possible within the shortest possible time to obtain a maximum effect of passive immunity for a given interval of time, thus reducing the amount of soil on which the epidemic could thrive. The simplest way to do this is to take parents as the donors and inject their own children with the parents' blood or with serum prepared from this blood. This avoids the necessity of setting up a laboratory technic to prevent the transmission of syphilis, though the possibility of a parent acquiring syphilis after the birth of the child must be kept in mind.

It follows reasonably well from the five premises presented in the foregoing that such a procedure would actually immunize a large percentage of the susceptibles in a community, and that, if the injections were completed within a few days, enough children would be able to resist invasion of the organism for a sufficient time so that the epidemic would lose its foothold and die out before the period of passive immunity would be lost. Further, it is logical that many of these children might accidentally come into contact with the virus during the period of immunity and be immunized actively and permanently by this contact without ever developing a clinical attack of poliomyelitis. Rhoads' work,[7] in which he was able to produce active immunity in monkeys by the injection of mixtures of immune serum and active virus, is suggestive that this desirable result might well be obtained.

Let us now attempt to make a measurement of the probable effectiveness of our passive immunization. It is necessary to assume that our reasoning up to this point is correct. Let us likewise assume that eighty per cent of the adult urban population taken at random would be found immune, as discussed under premise number five. If, then, for each child whom we wish to immunize in a large series of cases, we were to select an adult at random as the donor, the chances are that we would immunize eighty per cent of the children in the community. This in itself would be a very satisfactory result from an epidemiological standpoint, but we can do considerably better than this without adding greatly to our trouble. Let us consider the chances of immunization if we take the blood from two adults (father and mother) and inject the mixture from both into the child. Obviously the chances are that in some families both father and mother will be immune, in others either the father or the mother will be immune, and in some, neither father nor mother will be immune; the calculation of the chances of each of these combinations occurring is easily done arithmetically.

Jones[8] states the proposition mathematically as follows: "Thus to get the probability of a double success for a combination of two independent events, we must multiply together the separate probabilities for the success of each event taken by itself." In our case the chances are eighty in one hundred (80/100) that the father is immune; the chances are likewise eighty in one hundred (80/100) that the mother is immune. If we select a family at random then and wish to know what the chances are that both parents are immune, they will be $80/100 \times 80/100 = 64/100$, *i.e.*, 64 in 100.

Similarly, if we wish to know the chances of the father being immune and the mother non-immune, they will be $80/100 \times 20/100 = 16/100$.

The chances of the mother being immune and the father being non-immune are $20/100 \times 80/100 = 16/100$.

Adding together, then, the above results, for it is evident that a family cannot be simultaneously in more than one of these groups, it follows that there are 96 chances in 100 $(64/100 + 16/100 + 16/100 = 96/100)$ that one or the other of the parents, or both of them, are immunes if we select at random a family out of the general urban population. Conversely, there are only four chances in one hundred that the parents in this family will both be non-immunes.

Since the writer is not particularly trained mathematically, he gladly followed the suggestion of a University of Minnesota mathematician that these figures be put to an empirical test with a deck of cards, as follows.

The black cards were taken to represent males; the red cards, females. The twenty black cards numbered from one (ace) to ten were considered immune males; the similarly numbered red cards, immune females. Five of the black face cards represented non-immune males; five of the red face cards, non-immune females. Thus we had the character of immunity represented in the proportion of eighty per cent in our cards. The red and black cards were shuffled separately and were then laid on the table in pairs of one black and one red card each, thus representing married couples. To test our foregoing calculations it was then merely a matter of counting the number of times in a sufficient series of trials that (1) a black numbered card was paired with a red numbered card, (2) a black face card, with a red numbered card, (3) a black numbered card, with a red face card, and (4) a black face card, with a red face card. Arbitrarily, we repeated these trials until we had made up 625 couples. The percentage incidence of each group was then calculated with the result in immunological terms that:

1. The character of immunity occurred in both mates in 64.16 per cent of the pairs, as against the expected figure of 64 per cent.
2. Immunity occurred in the male but not in the female in 15.68 per cent of the pairs, as against the expected 16 per cent.
3. Immunity occurred in the female but not in the male in 15.84 per cent of the pairs as against the expected 16 per cent.
4. Immunity occurred in neither the male nor the female in 4.32 per cent of the pairs as against the expected 4 per cent.

This is sufficiently close correspondence of the theoretical and empirical figures to satisfy any reasonable objection raised against the technic of the calculation. It is clear, then, that if 80 per cent of the parents are immune, the chances are 96 in 100 that one or both of the parents in a given family will contain poliomyelitis antibodies and theoretically we should expect to immunize about 96 per cent of the children treated.

One might object that the figure of 80 per cent is too high. This cannot be disproved, but one is to be reminded that the clinical evidence on the age incidence of poliomyelitis is strong that the percentage of immune adults is actually high. If we substitute 60 per cent for 80 per cent and make our calculations, it will be found that the chances are 84 in 100 that one or both parents in a family will be immune. For the rural population, in which half of the adults have been assumed to be immune, our calculation would give us chances of 75 in 100 that the families will have parental immunity on one or both sides. This percentage would still probably be effective in combating an epidemic.

Now let us try to visualize the actual handling of an epidemic by these means.

The first point is that, since the efficacy of the procedure is uncertain, there should be provided a mechanism for keeping records on which to base future studies of the cases presumably immunized. For the first several trials, it is of extreme importance to the public and the medical profession to make as extensive a study of the situation as money will permit, so as to discover, if possible, the facts that will guide our steps in future epidemics. In the long run this will save money and effort.

In the second place, the procedure should be undertaken by the various interested groups coöperating to assure the smooth functioning of the program: State Board of Health, local health board, the local physicians, and, not least to be considered, the public in the affected vicinity. The State Board of Health has its finger on the general poliomyelitis situation in the state and surrounding states and routinely collects statistics of the sort which should be available in a situation of this kind. The local health board carries considerable responsibility in the community, and, with the physicians, would be able to assure the public that the measures instituted are as much in the interests of public welfare as they are for the intellectual exercise and academic amusement of the scientists who are likely to look on with the avidity of men watching an experiment in the physiological laboratory. The coöperation of the local physicians is further needed in the large amount of work in serum collection and injection that one would expect under these circumstances. Without the coöperation of the public in the vicinity, the plan is a failure before it gets under way. Here is one set-up in which full publicity should be given by newspapers and similar means as to the seriousness of the local poliomyelitis situation in order to bring people in for the prophylaxis within a short period of time. Consideration of local commercial interests which sometimes bring pressure to bear in suppressing such facts in order not to disturb business, would tend towards insufficient coöperation on the part of the public, and probably seriously hinder the effectiveness of the measures. In several of the universities of the country there are men especially interested in the poliomyelitis problem. These men might well be used in an advisory capacity in any attempt of this sort to control a given epidemic.

Third, the actual technic in individual families would be a simple matter. We would collect about 25 c.c. of blood each from the father and from the mother for each child to be injected, and mix these two samples. Immediate centrifugation of this blood would yield about 25 c.c. of serum which would then be aspirated into a syringe and injected into the back muscles of the child. In an emergency, whole blood could be used instead of the serum, but twice as much volume would be required for a given quantity of antibodies injected and more foreign material would be injected in the way of blood cells and fibrin, and this material would provoke a much more lasting local reaction, with consequent pain and discomfort. One or more portable outfits of centrifuge, antiseptics, syringes, dressings, and the like should be provided the State Board of Health for immediate transportation to an afflicted area. The cost of such an outfit would probably not exceed $500.00 In the larger communities, much of this material would already be on hand in the hospitals, clinics, and their laboratories. It should here be explained that 25 c.c. of serum is accepted as a proper dose because that is the approximate dose commonly recommended for the treatment of a case of poliomyelitis that has actually begun. In drawing blood from father and mother, it has been shown above that in a certain percentage of the cases we would expect to have immune bodies in the blood of only one of the donors, and this would result in only half a dose. Objections to this cannot be completely answered, but there is no good measure of what constitutes proper dosage anyhow, so it may as well be agreed tentatively that a half dose is better than none.

If, then, these injections can be administered within a period of a few days to the greatest part of the child population, it can logically be hoped, though admittedly it cannot be expected before several trials, that the desired number of susceptibles in the community will have been passively immunized for a time interval longer than the incubation period of the disease, and that therefore the chances of the spread of the epidemic will have been tremendously reduced.

or the sake of clearness, it must be again emhasized that this method is aimed at a single pidemic; if the injections should happen to give at degree of passive immunity which would ermit individuals accidentally exposed during is period to go on to a stage of active immuity, the circumstance would be a happy, though rgely an unexpected, one. Indeed this brings p the main point of objection that can be raised gainst this proposal. That is, it might be argued at we are simply increasing the number of suseptibles to provide soil for a more serious sitation in a subsequent epidemic by tiding them ver a time in which many would otherwise deelop an active immunity. The answer is, of ourse, that there is nothing to prevent the repetion of the method as frequently as is necessary keep the disease in check.

No attempt is made to summarize this paper as e controversial points are fairly numerous, and n interested reader should examine, think about, nd decide on them individually. The writer beeves, however, that the suggestions here set orth are sufficiently sensible to warrant an actual ial in the field.

BIBLIOGRAPHY

. Moro, E.: Ein Vorschlag zur Vorbeugung der epidemischen Kinderlähmung. Klin. Wchnschr., 9. Jahrg., Nr. 51:2383, December 20, 1930.

2. Flexner, S.: Poliomyelitis (Infantile Paralysis). Science, 74 (No. 1915):251, September 11, 1931.
3. Aycock, W. L., and Kramer, S.D.: Immunity to poliomyelitis in normal individuals in urban and rural communities as indicated by the neutralization test. Jour. Prev. Med., 4:189, 1930.
   Idem: Immunity to poliomyelitis in a southern population as shown by the neutralization test. Jour. Prev. Med., 4:201, 1930.
   Idem: Immunity to poliomyelitis in mothers and in the newborn as shown by the neutralization test. Jour. Exper. Med., 52:457, 1930.
4. Shaughnessy, H. J., Harmon, P. H., and Gordon, F. B.: The neutralization of poliomyelitis virus by human serum. Jour. Prev. Med., 4:463, 1930.
5. Schultz, E. W., and Gebhardt, L. P.: Incidence of "normal" persons possessing demonstrable antibodies for poliomyelitis virus in their serum. Proc. Soc. Exp. Biol. Med., 28:409, January, 1931.
6. Department of Health of New York City: A monograph on the epidemic of poliomyelitis (infantile paralysis) in New York City in 1916, Table IV, p. 364-365. Published under the direction of the Department of Health of New York City by M. P. Brown Printing and Binding Co., New York, 1917.
7. Rhoads, C. P.: Immunity following the injection of monkeys with mixtures of poliomyelitis virus and convalescent human serum. Jour. Exper. Med., 53 (No. 1):115, January, 1931.
8. Jones, D. C.: A First Course in Statistics, p. 138. G. Bell and Sons, Ltd., London, 1924.

PRESIDENT'S LETTER

"There Is Nothing Sacred About the Ancient Practice of Private Service for Private Fees."

LAST month the Public Health Education Committee quoted the above in its Forum from a recent official report of the Social Service Conference in Minneapolis.

This pronouncement is an extremely interesting sidelight on the state of mind of the social worker, this new professional in the field of care for the unfortunate. He is full of fine theories, this new professional; of scientific smatterings; of doctrinaire opinion. He knows a little about medicine and is fired with a laudable ambition to force upon the public all he knows and, sometimes, a good deal that he doesn't know about public and private health.

He has encountered difficulties, of course. Old precedent; the indisposition of most men to be forcibly educated into enlightened disease prevention, unwanted medical care and sanitation; economic entanglements and the point blank refusal of the doctors themselves to be drawn into anything that seriously endangers "the ancient practice of private service for private fees"—in other words, the ancient unhampered confidential relation between the doctor and his patient.

It is natural, probably, that he should be impatient at obstacles, particularly impatient at these incomprehensible physicians who are not rejoiced to come out of the small domain of private practice and become officers of the state for imposing their knowledge and skill upon the public.

This public has never been very tractable when it came to imposing ideal procedures of any sort upon it by administrative or legislative act.

The working of prohibition is an adequate example of public rebellion at measures of this sort and with it political graft and organized lawlessness.

The establishment of state medicine, which would inevitably become compulsory state medicine, opens the way to comparable irregularities and misfortunes.

Already the keen eye of the political aggrandizer has seized upon the well meant propaganda of the social worker to his profit. Doubtful laws have been passed in a good many different states, and the charlatans, the quacks and the ism-practitioners are finding their second wind through them.

I am in great hopes that the Medical Economics Committee appointed at our last state meeting will be able to inform us very definitely on everything that relates in Minnesota to the knotty problem of medical costs. There is some better way to deal with the problem of care of the sick than to rush still further into governmental paternalism. But we cannot defend and preserve all that is sacred in "the ancient private practice of medicine" unless we are able to check from authoritative sources the facts and figures of the social worker.

L. Sogge

President
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE

A. S. HAMILTON, M.D.	Minneapolis
D. C. BALFOUR, M.D.	Rochester
J. T. CHRISTISON, M.D.	St. Paul
E. L. GARDNER, M.D.	Minneapolis
JOHN M. ARMSTRONG, M.D.	St. Paul
R. E. FARR, M.D.	Minneapolis

CARL B. DRAKE, M.D., St. Paul	Editor
Lewis M. Daniel, M.D., Minneapolis	Assistant Editor

Associate Editors

A. B. Stewart, M.D., Owatonna	First District
F. M. Manson, M.D., Worthington	Second District
Geo. B. Weiser, M.D., New Ulm	Third District
H. B. Aitkens, M.D., LeSueur Center	Fourth District
F. U. Davis, M.D., Faribault	Fifth District
E. L. Gardner, M.D., Minneapolis	Sixth District
Paul Kenyon, M.D., Wadena	Seventh District
O. E. Locken, M.D., Crookston	Eighth District
E. L. Tuohy, M.D., Duluth	Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV October, 1931 No. 10

POLIOMYELITIS IN MINNESOTA

This year, instead of the usual relative absence of poliomyelitis cases during the winter and spring months, there were following the epidemic of 1930 twenty-eight cases with six deaths during the first six months. During the last week in July case reports increased rapidly for a total of twenty-eight cases for the month. In August there were 165 cases, and up to September 5 eighteen cases had been reported. This situation calls for alertness on the part of the physician to recognize cases of poliomyelitis, and especially to attempt to make the diagnosis in the preparalytic stage, as the evidence of the beneficial effect of convalescent human serum in the treatment of these cases before paralysis occurs is increasing.

Fortunately the Division of Preventable Diseases of the State Department of Health started preparing convalescent serum in increasing amounts as soon as the situation began to cause uneasiness, and a reasonable amount of serum is still available. As long as the supply lasts serum can be secured promptly by communicating with the Division, preferably by telephoning through the University of Minnesota. Twenty to 30 c.c. is furnished and should be injected intramuscularly as soon as possible. If too much time will elapse through waiting for convalescent serum, whole blood injected intramuscularly is considered of distinct value, as experiments have indicated that in individuals over two years of age who have never had clinical poliomyelitis the blood has protective bodies against poliomyelitis in as high as 50 per cent of the cases. This percentage increases in adult years and is higher in the urban than rural populations.

Stress must be placed upon the use of the serum in the preparalytic stage, which places a great obligation on the physician not to overlook cases of true poliomyelitis and on the other hand not to waste the serum by giving it to patients not suffering from this disease and thus deplete the supply before the need for it has passed.

In the presence of an acute febrile state, especially in a child, if there is evidence of stiffness of the neck, and more especially if there is stiffness and pain in the spine as indicated by having the patient attempt to bend in order to touch his knees to his head, poliomyelitis is the most probable diagnosis. This diagnosis may be made positively if in addition the spinal fluid examination reveals a moderately increased pressure with an increase in cells sometimes as low as 20 or as high as 700 or 800 per cu. mm. These cells at first may be largely polymorphonuclear but later are lymphocytes. The fluid is clear but to transmitted light may have a somewhat "ground glass" appearance. A positive globulin test occurs. No organisms are found. A clear sensorium in the presence of these findings is helpful in making a differential diagnosis. In any febrile case that continues to be doubtful an early spinal fluid examination is justifiable, especially during an epidemic. If a minimal quantity of fluid is removed aseptically no possible harm can result and may be the means of instituting early treatment. This is not to be construed as a justification for indiscriminate spinal punctures in early febrile states.

Until some early positive diagnostic means becomes available the diagnosis in the abortive and non-paralyzed cases will remain difficult and often impossible, but attention to the above simple rules will be found of distinct value.

It is hoped that the present reduction of mortality and morbidity from the early use of convalescent human serum may continue and that the supply of serum will be entirely adequate for future needs. E. J. Engberg, M.D.

INCREASING CLIENTELE

We are confronted from time to time with propositions conceived by some individual with an eye to business purporting to increase our field of professional usefulness. Most of us have the laudable desire to increase our clientele but we occasionally have a way of jumping at some tempting bait without careful investigation.

A newspaper man conceives the idea that the local medical profession should receive more publicity and works up the idea of a Sunday supplement array of photographs with an accompanying write-up of the leading members of the local profession—for a consideration.

Or someone gets out a bulletin and to help defray expenses seeks permission over the telephone to include your name—at a nominal charge.

Or a persuasive individual shows you a copy of a directory of experts in the legal and medical profession which has been published for forty or fifty years. You glance it over and sure enough it contains a very select list of the outstanding men in your locality and elsewhere. You are secretly flattered. The cost is moderate. Perhaps something of this sort is just what you should take on. Your true worth is finally coming to be recognized. You sign on the dotted line, later to find that the publication has little organization and no one has ever heard of it.

Or some layman is getting up something new and different—a directory of reliable physicians all over the country. Only those free from commercial taint and recognized by the profession itself are to be included. Data given will be so complete that selection of a physician for reference of patients will be easy. How much demand for such a publication there will be, however, is a matter of speculation.

Whether a medical directory of the professional standing of physicians edited by a layman can possibly be as reliable as one published by a medical organization, is questionable. The American Medical Association has for years published a directory of all licensed physicians which contains useful and reliable information, although admittedly not as complete as might be desired.

A limited directory appears in a number of the state medical journals. Paid insertions resembling professional cards with name, specialty and address appear monthly in the advertising section. This practice falls into the category of local custom and cannot be criticized. We can see some convenience in the method, but most physicians are well acquainted with the profession of the state and state journals have as a rule a limited circulation outside of the state. We imagine few physicians would refer patients on the basis of state journal insertions. Incidentally the practice furnishes an added source of income to the state journal and might be considered by our Association.

These numerous efforts to furnish reliable information as to professional qualifications have more or less worthy motives. Most of them, however, are attempts at forcing the growth of medical practice.

To quote from the "Principles of Medical Practice" of our national association: "The most worthy and effective advertisement possible even for a young physician, and especially with his brother physicians, is the establishment of a well-merited reputation for professional ability and fidelity. This cannot be forced but must be the outcome of character and conduct."

The newspaper publicity mentioned is, after all, direct advertisement. Directory insertions, while not strictly unethical, are probably of little value as a means of increasing one's practice.

CORONARY THROMBOSIS

The practical importance of the recognition of coronary thrombosis lies in the need for prolonged rest following the attack. As far back as 1912 Herrick described the clinical symptoms due to coronary occlusion, but it was not until recent years that the diagnosis became common.

The picture once recognized, the diagnosis is not difficult. The ashen complexion, weak and rapid pulse which may be one characteristic of fibrillation, the low blood pressure, and the pain, cardiac in distribution, form a syndrome which often is unmistakable. The pain may be precordial or epigastric, and may be agonizing or simply a distress, and is of longer duration than that of a typical angina pectoris, lasting sometimes for hours instead of minutes and often requiring more than one hypodermic of morphine for control. Vomiting associated with the pain is not unusual and is likely to draw the attention of the attending physician to the digestive system. A moderate elevation of temperature and leukocyte count after twenty-four to thirty-six hours confirms the diagnosis. The development of a pericardial friction rub or a stroke some two or three weeks later clinches the clinical diagnosis.

The electrocardiogram is a refinement in diagnosis which, though not essential, is usually confirmatory, showing as it usually does a gross disturbance of the myocardium. The high take-off of the T wave from the down-stroke of the R wave or its low take-off from the up-stroke of the S wave are likely to be present in the acute stages. In later records an upwardly convex S-T interval and negative T waves are likely. The electrocardiogram may return to normal with convalescence.

As the accident follows a coronary sclerosis the history generally brings out significant data. The patient has had symptoms attributable to arteriosclerosis—perhaps typical attacks of angina pectoris, evidence of poor myocardial response, intermittent claudication, or he (usually it is he) is at that age at which arterial degeneration is to be expected. Instances below the age of forty are comparatively rare.

Rest over a period of six weeks or more is most important. Rest and sedatives are the most essential treatment. Digitalis is probably not indicated in the absence of congestive heart failure and in some instances may be actually harmful. In the presence of heart block barium chloride has been recommended.

It is surprising with the increasing frequency of diagnosis how many patients recover from an attack in spite of the necessarily severe damage to the heart muscle. Location of the infarct and the size of the thrombosed vessel have an important bearing on the final outcome.

Before the clinical picture of coronary thrombosis came to be recognized by the surgeon as well as the internist, patients not infrequently underwent laparotomies due to mistaken diagnoses. Many reported dying from acute indigestion doubtless have been the victims of coronary thrombosis. With the syndrome in mind the diagnosis is comparatively simple.

HIBBING AND THE NORTHERN MINNESOTA MEDICAL MEETING

More than eighty practitioners of Medicine registered at Hibbing and attended the fine day's session of the Northern Minnesota Medical Association. Despite the depression and oppression, the attendance from such a wide area was, as ever, a fine indication of most doctors' zeal for instruction and organization, and enjoyment in fraternizing with their fellows.

Hibbing has much of interest to show its guests and visitors: a noonday trip on flat cars through the enormous open pit mines was a thriller equal to a review of the Panama Canal, with which comparative figures of earth movement are so often made.

The selection of Dr. G. S. Wattam of Warren for president brought to a most distinguished pioneer a much merited honor, and to the society a pledge of continued farsighted leadership.

No one can see in such amplified sectional meetings, or what are virtually yearly assemblages of contiguous county society groups, any interference with the purposes or prerogatives of the State Association. It seems necessary at times to reiterate this opinion because the notion abounds that defections, through hospital staff meetings, special groups, or the great colleges, detract interest and support from the official groups leading up to the American Medical Association. This notion is not denied by those who neither attend hospital staff meetings nor like them; men who are supposed to remain away from state and American Medical Association meetings because they ingest medical pabulum to satiety at home. Go to all these meetings, and you will find the sturdy veterans in the benches at all the good meetings. To locate the rest, for present or future, is not the purpose of this editorial.

E. L. T.

« A PAGE FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION »

Concerning the New Plan for Veterans Aid

The recently created Auxiliary to the Committee on Legislative Affairs occupied itself at a recent Chicago meeting with the so-called Shoulders Plan for disability insurance for veterans. This plan originated with H. H. Shoulders of Tennessee in the House of Delegates meeting held in June.

Following is a brief recapitulation of the Committee discussions, a complete report of which, together with recommendations for a campaign to promote the plan as a substitute for the present federal hospitalization plan, will be ready for publication shortly:

Veterans hospitals as now administered are full of veterans who have been completely and needlessly removed for long periods from their families.

Other equally deserving veterans have been totally unable to avail themselves of the medical service due them because they have refused to leave their families under such conditions.

Under the new plan for disability insurance there would be no need for the veteran to abandon his family in order to avail himself of his legitimate government aid. He would not even be obliged to leave his job unless his condition actually required hospitalization, in which case he could be hospitalized at an institution of his own choice near his own home.

At the present time there are some 220,000 empty beds in civilian hospitals in this country. The hospitals are inevitably handicapped, their efficiency reduced. Removal of veterans from their local communities is constituting an inceasingly serious problem to hospital administrations in their endeavor to maintain high standards of service at a price the general public can afford to pay.

Taxpayers are being unnecessarily taxed to pay for additional unnecessary beds in government hospitals while local institutions struggle with the problem of operating with 40 per cent of their beds vacant.

Doctors Pick 4-H Club Winners

On Tuesday, September 8, the Public Health Education Committee coöperated with the University Farm School and the Minnesota Public Health Association in examining nearly 100 4-H Club contestants for the boys' and girls' health championships of Minnesota. Ten specialists, under the direction of E. A. Meyerding, Executive Secretary, examined and graded the contestants at the 11 West Summit Avenue headquarters of the Minnesota State Medical and the Minnesota Public Health Associations. They reported, among all of these farm boys and girls, a remarkably high level of physical development. The finest specimens of all, however, and the highest score sheets, appeared wherever the medical profession had participated in the preliminary county contests. The winners were Geraldine Kohler of Windom and Clint Peterson of Worthington. Bernice Olson of Fulda, second highest among the girls, will go to Chicago with Clint Peterson in December to represent Minnesota in the national contest, because Geraldine Kohler is only thirteen years old and a year too young to be eligible for the trip.

As a rule the girls showed better physical condition, better posture and better grooming than the boys according to the examining experts. Such hunched shoulders and hollow chests as appeared among them were thought to have been caused by tight brassieres worn to achieve the flat figure which, until recently, led the styles.

It was worthy of note that the bunions, calluses and small calves usually noted among young people of this age were almost entirely absent. The ages of the girls examined ranged from thirteen to twenty, the boys from twelve to eighteen.

OF GENERAL INTEREST

Dr. C. M. Adkins has moved from Grygla, Minnesota, to Thief River Falls, Minnesota.

Dr. V. J. Telford, formerly of Edgerton, Minnesota, is now located at Litchfield, Minnesota.

The next meeting of the Association of Resident and Ex-Resident Physicians of The Mayo Clinic and The Mayo Foundation will be held October 8, 9 and 10.

Dr. A. A. C. Nickel, formerly of the Mayo Clinic, Rochester, Minnesota, has moved to Bluffton, Indiana, and is associated with the Caylor and Nickel Clinic there.

Dr. W. H. von Lackum, for the past eight years associated with the Section on Urology of the Mayo Clinic, has recently left Rochester. He has located in New York City, where he has entered training in preparation for the practice of orthopedic surgery. His address is 135 Slocum Crescent, Forest Hills, Long Island.

Dr. Ira M. Roadman, who has been in the Indian Service at Ponsford, Minnesota, for the past twelve years, is retiring from the Service to engage in general practice. Dr. Roadman's stay at Ponsford is considered a record for length of service of any physician at one station in the Indian Service. He has moved to Minneapolis where he expects to open an office soon.

Dr. Fred J. Pratt of Minneapolis attended the meeting of the American Academy of Ophthalmology and Otolaryngology, held at French Lick Springs, where he taught at the Section of Instruction, which was held in conjunction with the meeting.

Dr. John A. Pratt also attended the American Academy meeting, where he gave a paper on "Atrophic Rhinitis."

The Polk County Medical Society sponsored a joint meeting of the Friendly Valley County Medical Societies, at the Osceola Hotel, Osceola, Wisconsin, on September 23, 1931.

The periodic health examination was the subject of discussion and an actual examination illustrated it. Among the speakers were: R. G. Leland, Director, Bureau of Economics, American Medical Association, Chicago; W. A. O'Brien, Pathologist, University of Minnesota, Minneapolis, and C. B. Wright, Minnesota Delegate to the American Medical Association, Minneapolis.

A six o'clock dinner was served.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

SAINT PAUL QUACK PLEADS GUILTY TO VIOLATING BASIC SCIENCE LAW

State of Minnesota *vs.* Lobac

Charles Lobac, thirty-seven years of age, who claims to be a barber from Fresno, California, entered a plea of guilty to violating the Basic Science Law in the District Court at St. Paul before the Honorable Gustavus Loevinger, Judge, August 6, 1931. The defendant was arrested at Sixth and Wabasha Streets in St. Paul, where he plied his trade of selling a preparation called "Radian." The charge was one dollar per bottle, and the compound was alleged to cure everything from cancer to loose teeth. After spending six days in the county jail, the defendant heard the call of the harvest fields, entered a plea of guilty and was sentenced to thirty days in the St. Paul workhouse. The sentence was suspended after the defendant made an earnest plea to the Court that he be given a chance to leave the state and work in the harvest fields.

Mr. Brist reports that the State Board of Medical Examiners received very splendid coöperation from Detectives Tuckner and Johnson attached to the office of Michael F. Kinkead, county attorney, as well as from the county attorney's staff. Judge Loevinger very firmly informed the defendant that the practice of healing was intrusted to only those well educated and trained in that direction. No further trouble should be had with this defendant.

SECOND OFFENDER RECEIVES ONE YEAR IN WORKHOUSE

State of Minnesota *vs.* Ebeling

The above defendant, E. F. C. Ebeling, sixty-five years of age, who on June 10, 1931, entered pleas of guilty to violating the Basic Science Law and the Statute against distributing circulars and pamphlets on the restoration of lost manhood and other ailments, was committed to the Minneapolis Workhouse for a period of one year on September 8, by the Hon. Mathias Baldwin, Judge of the District Court.

Ebeling paid a fine of $100 in June for violating the Basic Science Law and received a suspended sentence of one year in the Workhouse for distributing the pamphlets. On August 23, Ebeling inserted an advertisement in the Minneapolis Tribune informing the public that he had the "new and right way to help Rheumatism, Stomach, Bronchial Asthma, Hay Fever, etc." He was arrested the next day on a complaint filed by Mr. Brist, representing the State Board of Medical Examiners, with the foregoing result. This means that Ebeling will spend the next twelve months in the Workhouse and undoubtedly it will "cure" the defendant of any desire to practice healing without a license, which should also serve as a warning to others similarly situated.

A very splendid attitude was shown in this case by Mr. Howard R. Hush, Chief Probation Officer, Hennepin County, and Mr. Archie Helwig, Deputy Probation Officer. Judge Baldwin is also to be commended for the prompt revocation of the suspended sentence. This indicates very clearly that quacks are going to receive some stiff jail sentences for repeated violations of the Medical Laws of this State.

ITINERANT PHYSICIAN SENTENCED TO SIX MONTHS IN COUNTY JAIL

State of Minnesota *vs.* John Edmund Doran

On Friday, August 21, 1931, the above defendant, John Edmund Doran, fifty-nine years of age, a licensed physician in the State of Minnesota, entered a plea of guilty to practicing medicine as an itinerant physician without a license before the Honorable Julius E. Haycraft, Judge of the District Court at Albert Lea, Minnesota.

For the past several years Dr. Doran has made a practice of traveling about the State of Minnesota and maintaining an office temporarily in hotels where he received patients after having advertised in the local newspapers his contemplated visit to the community. Among the towns where Dr. Doran maintained an office are Mankato, Winona, St. Cloud, Canby and Albert Lea. Dr. Doran was arrested on August 11, on a complaint filed by Mr. Brist, representing the State Board of Medical Examiners. The defendant waived his hearing and was held to the District Court under $1,000 bail. Dr. Doran finally decided to plead guilty with the foregoing sentence. Judge Haycraft suspended the sentence upon several conditions, the important one being that Dr. Doran is to refrain absolutely from practicing medicine in this state in more than one town. Dr. Doran is registered with the Board as maintaining an office at 335 Boston Block, Minneapolis.

OBITUARY

Henry J. O'Brien

1862-1931

Dr. Henry O'Brien, for years one of the leading surgeons in Saint Paul, died at his home September 16, 1931, following a stroke.

Born in Bayfield, Wisconsin, April 21, 1862, the son of Mr. and Mrs. Dillon O'Brien, he was brought to Saint Paul as a child, where he attended the public and parochial schools. The youngest in the family of one of the early settlers in the Madeline Island region, Dr. O'Brien returned for vacations frequently to his summer home on the island.

After receiving his medical degree from the University of Pennsylvania in 1888, he served as the second interne at St. Joseph's Hospital, Saint Paul, the first interne having been the late Dr. Arthur J. Gillette.

As a young man he became associated with Dr. Charles E. Smith and Dr. Everton J. Abbott. As years went on he showed his kindly interest in others of his profession by sharing his office and experience with a number of younger surgeons. Many a younger member of the profession could tell of instances of his generosity, which was one of his outstanding qualities. One of the first in Saint Paul to specialize in surgery, Dr. O'Brien enjoyed a well merited and extensive practice.

Early in his professional career Dr. O'Brien married Miss Mary King of Saint Paul. Three years after her death in 1909, he married Miss Caroline M. Beaumont, who survives him. He is also survived by two sons, Wallace D. O'Brien and Everton J. D. O'Brien, both of Saint Paul; one brother, Honorable Thomas D. O'Brien; two sisters, Miss Mary O'Brien and Mrs. Stan Donnelly, Sr.; and two grandchildren.

Dr. O'Brien was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the Minnesota Academy of Medicine.

W. L. Klein

Mr. William Livingston Klein, publisher of *The Journal Lancet* for over forty years and a resident of Minneapolis since 1881, died at his home August 20, 1931.

Borne in Barry, Illinois, on January 28, 1851, he attended Phillips Academy and Cornell University. After graduation from college he became head of the Normal School at Avon, New York, and while there, was married to Nora C. Sprague, daughter of a Syracuse judge. After being principal of a school in Woodstock, Illinois, he founded a book publishing company in Chicago, which still carries his name.

Moving to Minneapolis in 1881, partly on account of Mrs. Klein's health, he became the publisher of *The Journal Lancet* (then known as the *Northwestern Lancet*) in December, 1887. Two years before his death, on account of ill health, he sold the publication to the Cohen brothers.

Although known as a publisher, he was an able editor in addition. The tone of his publication attests the fact. His keen analytical mind is shown by his book entitled "Why We Punctuate or Reason Versus Rule in the Use of Marks," the second edition of which appeared in 1916, the first edition having appeared in 1896.

Mr. and Mrs. Klein were among the founders of the Trinity Baptist Church in Minneapolis and were very active in its progress. Mr. Klein is survived by his wife and two sons, Kenneth O. Klein of Minneapolis, and Horace C. Klein, president of the Webb Publishing Company of Saint Paul.

ARSPHENAMINE AND NEOARSPHENAMINE

Comparisons of the therapeutic value of arsphenamine and neoarsphenamine must take into account the difference of arsenical content, which is one-third higher in the case of arsphenamine than in the case of neoarsphenamine. Even allowing for this difference, it is quite generally conceded that arsphenamine as such is therapeutically the more effective than neoarsphenamine. The evidence for the efficiency of neoarsphenamine is conspicuously small. The most carefully investigated and reported clinical material has been treated with arsphenamine rather than with neoarsphenamine. One of the characteristics of neoarsphenamine, which will affect any attempt to estimate its gross clinical value, is the marked variability between different lots of the preparation, even from the same manufacturer. (Jour. A. M. A., August 15, 1931, p. 480.)

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*

Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question*—Please send me information concerning poliomyelitis. I am particularly interested in the use of convalescent serum, where it may be obtained, how much to give, and its probable effect.

Answer—Acute anterior poliomyelitis is a pathological misnomer to a certain extent. The usual after-effects represent chiefly the involvement of the anterior horn cells. The pathologists see an entirely different lesion at necropsy. There is involvement of the anterior horn cells, diffuse and focal myelitis and usually meningitis and encephalitis. Many of the fatal cases show bulbar lesions but death is more frequently due to paralysis of the cervical and thoracic regions.

The term infantile paralysis also fails to accurately state the case as the disease is rare in true infancy. The disease usually occurs in the young but may be found at any age. The peak of incidence is usually in the fall and frequently subsides with the coming of cold weather. There are also exceptions to this rule as the disease may persist well into the fall and may occur at any time of the year. The outbreak in the fall is frequently associated in many minds with the opening of school. This is probably not true.

The disease occurs in both the paralytic and non-paralytic forms and most observers believe it is due to a virus. When the virus of poliomyelitis is mixed with pooled serum from the general population, it is found to be approximately 80% efficient in protecting monkeys from cerebral inoculations. This seems to indicate that a large percentage of adults have had the non-paralytic form of the disease at some time in the past. At the same time the paralytic poliomyelitis is present, there are numerous cases of ill-defined maladies in the community. These are usually interpreted as non-paralytic forms of the infection in the light of our present knowledge.

The pre-paralytic symptomatology is not characteristic. It may mimic any one of several minor forms of general disturbance. Fever is usually present. The patient may have a sore throat, gastro-intestinal upset, malaise, general muscular soreness, spinal rigidty, headache, neck rigidity, positive Kernig's sign, or other complaints. Convalescent serum is most effective when given in the pre-paralytic stage. It may be obtained by getting in touch with the Division of Preventable Diseases of the State Board of Health in Minneapolis.

Anti-bodies apparently persist after infection. It does not seem to make very much difference how much time has elapsed since the donor had the disease. The serum is usually pooled but individual donors may be used and approximately 20 to 30 c.c. are injected intramuscularly into the buttocks. Its value is very difficult to ascertain because of the difficulty in making a diagnosis before paralysis develops and because the paralysis shows spontaneous tendency to improve. It should be used in selected cases with these reservations.

In some epidemics, epidemiologists insist on an increased spinal fluid cell count before it is given. While meningeal involvement is usually present, it may be absent or mild in degree. When paralysis of the muscles of respiration develop, the Drinker apparatus is used for the purpose of augmenting the patient's own efforts at respiration. It is not in any sense a curative measure but simply acts as a mechanical aid. If the disease does not progress, it is most helpful in maintaining life. Paralysis is seldom the initial symptom and is usually preceded by an illness of varying time and severity. All patients with swallowing difficulties should be considered suspect poliomyelitis cases until proved otherwise. In case of doubt, physicians should communicate with the Division of Preventable Diseases for advice and assistance. All patients who have recovered from poliomyelitis should be encouraged to offer their blood for the collection of convalescent serum. Paralytic cases should have the affected parts placed in some type of corrective device to prevent deformity. Whether motion should be started early or late is still a matter of conjecture and well-informed men will be found on both sides of the question.

2. *Question*—I recently purchased a Sahli hemoplobinometer. The circular which accompanied it stated that 100% represented a different amount of hemoglobin than I was accustomed to use in terms of grams in each 100 c.c. How is it possible to convert this figure?

Answer—It is usually best to standardize each tube and to disregard the manufacturer's statement as to the amount represented on the scale. This may be done by accurately counting the blood of five or ten persons with an average of 5,000,000 cells per cubic millimeter. The average hemoglobin reading of the group should be taken as 100% and the correction used for all the figures.

3. *Question*—What is the latest treatment for the correction of so-called "trench foot" in the army?

Answer—I assume you mean by "trench foot" the condition also known as "athelete's foot" or "epidermophytosis." If the lesions are acute or weeping the best treatment is a pack of 1-4,000 solution of potassium permanganate, and bed rest. When the condition is under control, it may be treated as a chronic affair. The best treatment at this stage is Whitfield's ointment, half or full strength, applied twice daily. Full strength of Whitfield's ointment is salicylic acid 2, benzoic acid 4, and petrolatum 30 (metric).

It is rather difficult to predict the outcome as re-infection is difficult to avoid. If the patient can boil his socks, change his shoes frequently, and avoid stepping on affected floors, *e.g.*, swimming pools and gymnasium, a cure is possible. It is a difficult persistent disease to treat and many things have been tried. Some of these remedies advertised directly to the laity are not a cure-all. Many articles have recently appeared concerning this disease and if the above treatment is not effective, please write again.

COMMUNICATION

Terre Haute, Indiana
June 20, 1931

Dear Sirs: Re: Goiter Classification and Nomenclature.

This association would appreciate very much your giving wide publicity to its approval of the following classification and nomenclature:

Clinical Classification:

Type 1—Non-toxic Diffuse Goiter
Type 2—Toxic Diffuse Goiter
Type 3—Non-toxic Nodular Goiter
Type 4—Toxic Nodular Goiter

Nomenclature:

Our association advocates a policy of using the simplest and yet the most descriptive terminology possible.

The use of proper names, while it is impossible to dispense with many well established ones in goiter literature, be discouraged; as should coined words invented to popularize a fad or fancy.

Emphasis should be made upon the importance of not confounding varieties and sequelæ with types. The use of such terms as exophthalmic, hemorrhagic, cystic, adolescent, colloid, intra-thoracic, substernal and congenital are perfectly proper when used to describe varieties, but only constant characteristics should be used to designate types.

Thanking you very much for your cordial coöperation, I am,

Fraternally yours,
American Association for the Study of Goiter,
J. R. Young, M.D., *Corresponding Secretary.*

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of October will be as follows:

October 7—Corneal Ulcer
October 14—Prevention of Hay Fever
October 21—Cretinism
October 28—Brain Tumor

MINNESOTA MEDICAL ALUMNI ASSOCIATION HOMECOMING PROGRAM

The homecoming football game will be the occasion for the return of many medical alumni to Minneapolis. The committee of the Medical Alumni Association is again making it possible for the returning alumni to enjoy a worthwhile scientific program in connection with their visit.

At 9 A. M., Friday, October 30, 1931, the day preceding the game, the following program will be presented at the Eustis Amphitheatre in the University Hospital:

Dr. J. F. Corbett, Minneapolis, presiding

Oral Cholecystography—J. R. Aurelius, St. Paul
Pediatric Clinic—Irvine McQuarrie, Head of Department of Pediatrics, Medical School, University of Minnesota
Skin Lesions (demonstration by lantern slides)—John Butler, Minneapolis
The Present Status of Surgery of the Gall Bladder—E. Starr Judd, Rochester, Minn., President, American Medical Association.
Blood Pressure in Relation to Insurance Examinations—C. Naumann McCloud, St. Paul Medical Director Minnesota Mutual Life Insurance Co.
Practical Demonstration of Varicose Vein Injection—J. M. Hayes, Minneapolis.

Luncheon at 12:00 o'clock, at which time Dr. Richard E. Scammon, Dean of Medical Sciences, University of Minnesota, will speak.

The delegates will meet for the annual business meeting of the association at this time.

Dr. C. N. Hensel, St. Paul, will preside at the afternoon session, which will convene promptly after lunch and the business meeting, with the following presentations:

Orthopedic Clinic—Wallace H. Cole, St. Paul
Pain in Gynecological Diagnosis—S. B. Solhaug, Minneapolis
The Unimportant Heart Murmur—S. Marx White, Minneapolis, President, American College of Physicians.
Thoracic Surgery in the Treatment of Tuberculosis—T. J. Kinsella, Glen Lake Sanatorium.
Neurological Gaits and Other Conditions (demonstration with moving pictures)—J. G. McKinley, Professor of Nervous and Mental Diseases, Medical School, University of Minnesota

RED RIVER VALLEY SOCIETY

The Red River Valley Medical Society will meet at Thief River Falls, Tuesday, October 6. Speakers scheduled are: W. A. Fansler, Minneapolis; E. A. Meyerding, St. Paul; J. A. Myers, Minneapolis, and Mrs. S. S. Hesselgrave, St. Paul, who will address the Auxiliary.

Dr. Myers' subject will be "Tuberculosis." Dr. Fansler will talk on "Rectal Difficulties." Dr. Myers will also address a luncheon meeting at Thief River Falls on the same day.

DODGE COUNTY SOCIETY

The Mantoux tuberculin test will be discussed at a meeting of the Dodge County Medical Society to be held at Kasson on Friday evening, October 9, in the office of F. D. Smith.

Dr. J. A. Myers, Minneapolis, and Dr. E. A. Meyerding, St. Paul, will talk.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Dr. Charles C. Allen of Austin was chosen president of the Southern Minnesota Medical Association at the annual convention held at Faribault, Minn., August 25.

Others elected are Dr. R. V. Williams, Rushford, first vice president; Dr. B. J. Gallagher, Wascca, second vice president, and Dr. M. C. Piper, Rochester, secretary-treasurer.

Medals were presented to Dr. W. P. Herbst of Minneapolis and Dr. R. K. Ghormley and Associates of Rochester for the best individual scientific exhibits at the State Meeting this year, and to Mr. T. C. Erickson, a senior medical student at the University of Minnesota, who in his junior and senior years was selected as having shown the highest degree of efficiency in the clinical fields of medicine and surgery.

JOINT MEETING OF CHISAGO-PINE AND CENTRAL MINNESOTA DISTRICT SOCIETIES

The question of amalgamation was discussed by the Chisago-Pine and the Central Minnesota District Medical Societies at Cambridge, on Thursday, September 17. Visiting speakers were: E. A. Meyerding, St. Paul; W. A. Coventry, Duluth; F. J. Savage, St. Paul, and Mrs. S. S. Hesselgrave, St. Paul.

D. E. McBroom, Cambridge, Superintendent, State Colony for Epileptics, acted as host for the meeting which was held at the Cambridge institution.

NORTH CENTRAL BRANCH OF THE AMERICAN UROLOGICAL ASSOCIATION

The eighth annual meeting of the North Central Branch, American Urological Association, will be held in St. Paul, Thursday, Friday and Saturday, October 29, 30, and 31, 1931.

Headquarters will be at the Lowry Hotel. The papers of the scientific program will be presented in the Ramsey County Medical Society assembly room, Thursday forenoon and afternoon, October 29, and Friday afternoon, October 30.

One afternoon session will be devoted to "Obstruction of the Upper Urinary Tract," for which Dr. Frank Hinman, San Francisco, will make an introductory address. The other afternoon session will be on "The Myoneural Mechanism of the Urinary Tract," for which Drs. James Learmonth and William F. Braasch, Rochester, will make introductory addresses.

Members of the Ramsey County Medical Society are cordially invited to attend.

Clinical demonstrations and urologic operations will occupy Friday forenoon at the Ancker Hospital, Saint Paul, and Saturday forenoon at the University Hospital, Minneapolis, and Glen Lake Sanatorium.

Dr. Frederic E. B. Foley, secretary, 229 Lowry Medical Arts Building, St. Paul, is in charge of arrangements.

WOMEN'S AUXILIARY

Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

RAMSEY COUNTY AUXILIARY

The Ramsey County Auxiliary acted as hostesses to the visiting women attending the Mississippi Valley Tuberculosis Conference, September 21, 22, and 23. They had charge of a Registration Desk and held a tea, Tuesday, September 22, in the new Club Rooms of the Ramsey County Medical Society. A drive and golf were scheduled for the visitors. Women from eleven states attended the meetings. Mrs. W. H. Hengstler, as President of the Auxiliary, was assisted by the Hospitality Committee, Mrs. Edward Schons, Chairman, in the entertainment of visitors.

HENNEPIN COUNTY AUXILIARY

The Hennepin County Auxiliary opened their fall program with a talk by Dr. C. E. Rudolph on "The Cost of Medical Care," September 23, in the Club Rooms of the Hennepin County Medical Society.

The Hennepin County Auxiliary will take over the serving of luncheons again this fall, beginning with the October meeting of the doctors. Mrs. Stephen Baxter will be the general manager.

The Hennepin County year book just published promises an interesting program for the year. In October a Reciprocity Meeting will be held with two auxiliary artists presenting the program. Mrs. W. E. Patterson will read "The Flattering Word," a one act play by George Kelley, and Mrs. Harold Boquist will entertain the audience with musical numbers. Dr. Mabel Ulrich will talk on "Books" at the November meeting, and Mrs. E. G. Wanous will give one of her interesting book reviews at the Christmas Silver Tea. In January, the Auxiliary members are to have a "Great Day," when Mrs. Walter J. Marcley will talk about the Disarmament Conference.

SCOTT-CARVER COUNTY AUXILIARY

Scott-Carver Auxiliary will have a dinner meeting at the home of the president, Mrs. Simmons, in Chaska, Tuesday evening, September 8. A health movie program, with a health talk, will be the evening's entertainment. The doctors will meet the same evening for their regular business.

NEW AND NON-OFFICIAL REMEDIES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

Sandoz Chemical Works, Inc.
Gynergen Solution 0.1 per cent

E. R. Squibb & Sons
Squibb Chocolate Vitavose

Winthrop Chemical Co., Inc.
Skiodan

Elixir No. 229 Ephedrine Sulphate 2 grains.—It contains ephedrine sulphate-Lilly (New and Non-official Remedies, 1931, p. 177), 0.44 Gm. in 100 c.c. (2 grains per fluidounce) in a menstruum composed of alcohol, glycerin, sucrose and water, with flavoring agents. Eli Lilly & Co., Indianapolis.

Ventriculin, 100 Gm.—Each bottle contains 100 Gm. of ventriculin (New and Non-official Remedies, 1931, p. 238). Parke, Davis & Co., Detroit. (Jour. A. M. A., August 8, 1931, p. 391.)

FOODS

The following products have been accepted by the Committee on Foods of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in Accepted Foods:

Kellogg's Rice Krispies (Kellogg Co., Battle Creek, Mich.).—A ready to eat, cooked and toasted rice cereal flavored with malt syrup, sugar and salt. It is claimed to be a delicious, cooked, easily digested cereal.

Embo (Purified Wheat Embryo or Germ) (General Mills, Inc., Minneapolis).—Wheat embryo or germ practically free of bran or other parts of the wheat berry hermetically sealed in cans. It is claimed that the product retains the food value and vitamin content of natural wheat germ or embryo which is not modified in manufacture by any heating, bleaching or other process. Unless otherwise prescribed it can be conveniently ingested with minimum loss of vitamin potency by mixing with cereals, vegetables, fruits, after these have been cooked. (Jour. A. M. A., August 1, 1931, p. 321.)

Mazola (Corn Products Refining Company, New York City).—A canned refined corn oil. It is claimed to be a highly refined corn oil for baking and table uses.

Tea Table Sandwich Bread (Sliced) (Liberty Baking Company, Pittsburgh, Pa.).—A white bread made by the sponge dough method, in sliced loaf form. It is claimed to be a bread of good quality.

Liberty Delicious Bread (Liberty Baking Company, Pittsburgh, Pa.).—A white bread made by the sponge dough method. It is claimed to be a bread of good quality.

Liberty Grade A Bread (Liberty Baking Company, Pittsburgh, Pa.).—A white milk bread made by the sponge dough method. It is claimed to be a bread of good quality. (Jour. A. M. A., August 15, 1931, p. 463.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles whic they run across in their reading and send the abstract to the physicians in charge of the respective sections. I order to avoid duplication it would be well to communicate with one of the section supervisors before th article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

NEURO-OTOLOGICAL OBSERVATIONS IN CONCUSSION OF THE BRAIN: F. H. Linthicum and C. W. Rand (Arch. Otolaryngology. 13: June '31, p. 785). A series of thirty-six cases is reported in each of which some abnormality of the vestibular response was elicited. The authors refer to vertiga as being of two types:

1. A true or systematized vertigo in which external objects appear to revolve around the subject in a definite direction. This type is usually considered to originate in the end-organ and is often associated with spontaneous labyrinthine phenomena such as nystagmus, past-pointing, and characteristic disturbances in station.

2. False, or non-systematized vertigo, which may be simply a feeling of uncertaining or confusion. The lat-

ter form of equilibratory disturbance may be caused by ocular disturbances or intracranial lesions involving the vestibular tracts, or may be due to so-called neurasthenic vertigo. In other words, it does not originate in the end-organ, but may be the result of a derangement of the ocular, tactile, or joint muscle-sense or a combination of any of these.

The examination of the vestibular apparatus consisted of the turning tests and caloric mass irrigation. Independent neurological examinations had been made in most cases. The authors stress the importance of an accurate history, stating that it plays no small part in the final determination of the extent of injury and the consequent prognosis.

No definite statement is made of the actual number of these 36 cases in either group of the above mentioned classification. Only 6 persons failed to show some hearing impairment of the receptor or inner ear type manifested by the usual shortening of bone conduction and loss of acuity for high notes.

The authors conclude that in practically all cases of cerebral concussion, the patient complains of some form of equilibratory disturbance which may be demonstrated by some abnormality in neuro-otological observations. These observations are usually indicative of mixed central and end-organ damage rather than the involvement of the end-organ alone. The most constant observations are abnormalities in the past-pointing reactions. Traumatic equilibratory disturbances arising in the end-organ are more apt to readjust themselves than those of central origin.

Lawrence R. Boies.

THE CONTROL OF MYOPIA: Edward Jackson, M.D., D.Sc., F.A.C.S., Denver, Colorado (Amer. Jour. of Ophthal., Vol. 14, August, 1931, No. 8). The author starts this article with the statement that "Control of Myopia is practical, cure is not; and prevention is still in the future."

He then gives a review of the literature which in the past has for the most part been "theoretic and philosophic."

The author observes that excessive convergence without accommodation is the most important factor in progressive myopia, and that our most valuable therapeutic measure is the restoration, as early as possible, of the normal relation of these two functions. That myopia causes four per cent of the cases of blindness of both eyes and is liable to lead up to other causes, such as choroidal atrophy, detachment of the retina and cataract.

He then gives his observations taken from the examination of the records of all myopia in his private practice of over thirty years. Among patients under twenty-five years of age, when first seen, the time of life when myopia is most likely to develop and be progressive, were found seventy-seven cases, 154 eyes, which were examined after at least three years of wearing constantly their full correcting glasses.

These patients were under observation from three to thirty years, averaging the age of sixteen when first seen, and twenty-five at the date of last observation.

Of the 154 eyes there were twenty-seven that became less myopic. There were forty-four eyes that showed no change of refraction. There were fifty-two eyes in which the myopia increased less than 1 D. There were thirty-one in which it increased 1 D., or more, the average being 2 D. That is, under the constant wearing of full correcting glasses, 45 per cent of the eyes showed no increase of myopia at any time; 34 per cent showed an increase of less than 1 D., and only 21 per cent showed an increase of 1 D. or over, an average increase of nearly 2 D.

The enormous statistics showing the increase of myopia during school life and all careful observations of its course from Sir Charles Blagden in the 18th Century to the present day, indicate that the development and increase of myopia depend on convergence of the eyes for near work, and that avoidance of such convergence, by occupation and the use of concave lenses, is the foundation of its rational control.

For the common, most important form of axial myopia the program includes:

1. Avoidance of much use of the eyes for near seeing in early childhood, during the period of most rapid development and growth, up to six to ten years.
2. Testing the vision and examining the eyes of children entering school, especially for ocular defects that will lead to excessive convergence. Such testing should include accurate measurement of ametropia.
3. Watching the children in school to secure an erect posture and keeping of the book away from the eyes. Good print and good illumination both in school and in the home. Foerster showed that the home work done with the eyes was greater than the work in school.
4. Sight-saving classes for children having poor vision, or suffering from any ocular condition that would be seriously aggravated by ordinary school work. Each of these children should be placed in such a class on the advice of an oculist, who should see the child every three months, so long as the sight-saving supervision was necessary. In such a class the child should spend a part of the day in the special room for sight-saving instruction, and a part receiving oral instruction with seeing children of the same grade.
5. The constant wearing of accurate correcting glasses, especially of full strength concave glasses.
6. Regular daily, outdoor living and exercise; for children, youths and young adults.
7. Close attention to the child's general health and nutrition, including care as to vitamins, and endocrine secretions. As to hereditary and congenital myopia, this may need to be extended to the care of the expectant mother.

Such a program intelligently carried out would prevent most cases of myopia, would limit to low degree most of the cases that did arise, would prevent the degenerative changes that characterize the later stages of high myopia, and would prevent about four per cent of the blindness that now occurs in civilized countries.

L. G. Culver, M.D.

MEDICINE

TUBERCULOSIS ABSTRACTS*

Collapse therapy in tuberculosis is now an established procedure of unquestioned value. Clive Riviere said: "No more hopeful ray of sunshine has ever come to illumine the dark kingdoms of disease" than artificial pneumothorax. This therapeutic procedure, however, has its limitations. Mechanical difficulties brought on by the pathological condition of the lung often make collapse by the insufflation of air or gas impossible or ineffective. Latterly, the injection of oil into the pleural cavity for certain cases has found favor, especially among French phthisiologists. Somewhat timidly, oleothorax is being introduced and practiced in this country. From an article by L. E. Oppengame in the *American Review of Tuberculosis,* June, 1931, the following abstracts are derived.

OLEOTHORAX

Oleothorax is the injection of mineral or vegetable oil into the pleural cavity. The indications for its use are: to avoid adhesions, to produce a more effective collapse when pneumothorax is ineffective, to give more rigidity to the pleura if a bulging of the mediastinum occurs, to close a perforation of the lung, to change an empyema into a sterile disinfectant oil. In rare cases, it may be used instead of artificial pneumothorax when for any reason a patient cannot return for routine refills.

According to Fontaine's statistics, about 70 per cent of pneumothorax treatments are complicated by pleurisies, 22 per cent result in empyema, and 15 per cent make further collapse therapy impossible because of resulting adhesions. The reason pneumothorax continues to be used in the face of these troublesome sequelæ is because not all pleurisies are intoxicating for patients and a great number are beneficial for pulmonary tuberculosis. In fact, by some specialists, the development of pleural effusion is regarded as a natural healing phenomenon. There is evidence to show that pleural fluid has a deterrent influence on the development and the virulence of the tubercle bacillus. But certainly not all pleurisies are benign. Dumarest has classified pleurisies into the following groups:

Tolerated Pleurisies with little, torpid, precocious effusion produced by trauma or resulting from irritation of the pleural membranes from air insufflation. In these cases, there is no fever or pain, and reabsorption sometimes occurs by itself.

Acute Febrile Effusions (serofibrinous) which may appear any time during pneumothorax treatment but frequently between the third and fifth month. Effusions are profuse, there are chills, fever, a stitch in the affected side, dyspnea, irregularity of pulse, increased expectoration, and cough. The condition passes through phases but may persist for months. It is mostly benign, often regresses, and usually disappears when air refills are discontinued, but may subsequently cause adhesions. Empyema may, however, develop from it.

For these two forms of pleurisy, it is often better, after the acute stage is over, to aspirate the fluid and refill with air.

Malignant Pleurisies, or purulent, chronic effusions with high and prolonged fever, and causing malnutrition, may develop from the above mentioned forms. The difference is not easily recognized at once; only the evolution of the disease enables one to make the differentiation. Such malignant pleurisies result in complete prostration or amyloid degeneration and usually end fatally.

With rare exceptions, there is no use for oleothorax in benign pleurisies, but in malignant cases, the first step in any intervention should be an oleothorax. Even if the operation is unsuccessful, the patient is improved and thereby placed in a more favorable condition for further surgical interference, such as rib resection or thoracoplasty. For an empyema complicating an artificial pneumothorax (which means pleurisy with tuberculous lesions), oleothorax is the only choice as thoracotomy is almost always fatal. Thoracoplasty done for tuberculous pleurisies in general leaves a persistent fistula; oleothorax, if properly done, is entirely harmless. For secondarily infected pleurisies (streptococcic, pneumococcic), drainage and not oleothorax is the proper treatment.

OLEOTHORAX FOR LUNG PERFORATIONS

The use of oleothorax for lung perforations is very limited. A small perforation as the result of the breaking of adhesions or a rupture into the pleural cavity of a small, subcortical vomica not connected with a bronchus, justifies an oleothorax. Unfortunately, not very often are we able to differentiate the small, benign perforation from a large, fatal one. (The author describes differential signs.)

Temporary perforations do not need an oleothorax. Valvular perforations, not helped by deflation, are benefited by oleothorax. Large perforations are mostly fatal, but if unilateral and recognized at once, thoracoplasty is a help. Burnand and Roussel, however, injected oil in such cases, thereby disinfecting the pleura and placing the patient in better condition for a final thoracoplasty.

USE IN ADHESIONS

With oleothorax, adhesions may be avoided or prevented, though not all adhesions need an immediate oleothorax. (The beginning of adhesions can be foreseen by manometric readings and fluoroscopy.) In unsuccessful pneumothorax, for instance, in partial pneumothorax when only one part is collapsed far from a cavitation which remains open, air insufflations are not only useless but also dangerous because of the necessary high pressure.

OTHER INDICATIONS

Mediastinal hernia or bulging produced by low pressure on the opposite side of a pneumothorax may be reduced by oleothorax. Finally, in exceptional cases, if patients are not able to stay in the hospital or to return for refills, a pneumothorax may be changed into an oleothorax, which requires refills only about every two months.

---

*Reprinted from *Tuberculosis Abstracts,* a review for physicians, issued monthly by the National Tuberculosis Association, October, 1931, Vol. IV, Number 10.

TECHNIC AND RESULTS

Accidents have occurred from the injection of badly or anciently prepared, not-neutralized vegetable oil. But if all precautions are taken in its preparation, there is no great difference in the choice of the kind of oil used. The power of reabsorption depends more on the individual than on the kind of oil. The vegetable oil is milder for the pleura and not so irritant as mineral oil. The author uses mineral oil when he wishes to avoid thickening of the pleura and to produce more compression, while the vegetable oil is used mostly in empyemata.

For the last few years, he has treated many patients with oleothorax and has not had one death directly from the operation. Reported cases of death are probably due to neglect of the pressure which oil produces —a most important factor.

Of the four case histories cited by the author, the following is quoted:

Case 2: Miss A. B., age 21, admitted July 29, 1929. *Diagnosis:* Chronic pulmonary tuberculosis. *X-ray Report:* Bronchopneumonic type of pulmonary tuberculosis, mainly unilateral. *Left Lung:* Diffuse involvement of entire lung with multiple cavities in upper lobe. *Right Lung:* Negative, except for some hazy appearance at apex and increased size of hilar lymph nodes (?); lower bronchial roots somewhat prominent.

January 30, 1930: Initial pneumothorax 400 c.c.,-4, -1). *February 20, 1930:* After several refills, re-examination of the chest shows left-sided hydro-pneumothorax, with fluid level up to third interspace and displacement of mediastinum and trachea to the right. In the region of the left upper lobe is seen some lung tissue, with well defined and sharply demarcated area of lessened density which are undoubtedly uncollapsed vomicæ held by adhesions to the chest-wall.

February 24, 1930: Lemon-colored fluid aspirated from left chest (500 c.c.); 30 c.c. of oilgomenol injected; normal reaction. Patient had in four- to six-day intervals several injections until complete blockage was obtained by June 30, 1930. Since the last injection, we control the amount of oil once every four weeks. The reabsorption of oil in this case since a blockage was obtained was very slow, and we injected only 5 to 10 c.c. of oil once a month.

This case is particularly interesting. Why did we change an acute febrile effusion into an oleothorax and what effect was obtained by an oleothorax) Because in spite of the effusion, the cavitations in the upper lobe were open on account of adhesions and because a menacing mediastinal hernia (bulging) occurred which interfered with the further pneumothorax insufflation. After 2 to 3 months of oil treatments, we obtained a rigidity of the mediastinal pleura, the hernia disappeared, and we were able to inject a considerable amount of oil without fear of rupture. In the meantime, the patient developed after a pneumonia a right-sided pulmonary lesion. We feared to perform a right-sided pneumothorax on account of the left-sided oleothorax, and decided to inject sanocrysin intravenously. The patient is now in a very good condition.—*Aleothorax, L. E. Oppengame, Amer. Rev. of Tuberc., June, 1931.*

PEDIATRICS

STUDIES ON THE INCIDENCE OF TUBERCULOUS INFECTION: Elizabeth Leggett and F. F. Callahan (Amer. Rev. Tuberc., XXIV:2:113-135. August, 1931). The authors report a recent study on the incidence of tuberculous infection in several different groups of Minnesota school children. Results are compared graphically with those of similar studies elsewhere, and are shown to be lower in this series than those in larger cities as Vienna, Philadelphia and Minneapolis, but higher than for rural Minnesota or rural Hennepin county. Two different groups in Saint Paul were tested, the total number being about 600. The one group came from middle-class homes where known exposure was low. Of these, 20 per cent showed a positive Mantoux, and 6 per cent had X-ray findings of tuberculosis. The second group came from poor homes but here also the history of exposure was low. Of these, 22 per cent had a positive Mantoux; 7 per sent had X-ray findings. These figures are compared with the incidence in Minneapolis school children of 47 per cent as reported by Myers and Harrington. In the Pine City schools, 265 children were tested. Under 12 years, only 4 per cent were found positive as against 25 per cent in the high school group. The high incidence in the older children was explained by definite exposure to an active case of tuberculosis in a teacher. Work on a fourth group in Morrison county, where the incidence of the disease is known to be high, will be reported later. Of 274 children already examined, 31 per cent reacted positively. In both the Pine City and Morrison County groups, cases of active adult tuberculosis were found, while there were none in the St. Paul children studied. A limited study of autopsy material is added.

The authors stress the value of tuberculosis surveys in schools and emphasize the fact that a teacher with active pulmonary tuberculosis is a definite source of infection to children.

L. G. FRARY, M.D.

THE EFFECT OF PASTEURIZATION UPON THE VITAMIN C CONTENT OF MILK IN THE PRESENCE OF CERTAIN METALS: E. W. Schwartze, F. J. Murphy and G. J. Cox (Jour. Nutrition, 4:211, July, 1931). The Vitamin C destruction in fresh milk samples pasteurized aërobically in aluminium, tinned copper, and copper was determined quantitatively by measuring their values in preventing scurvy in guinea pigs. The destruction was placed at 20 to 40 per cent in aluminum. This is greater than that obtained upon boiling milk for 5 minutes, and is rather to be expected as the duration of exposure in pasteurizing is much longer and is strictly aërobic. The effect of pasteurizing milk in tinned copper was slightly greater than that found in aluminum, referable the authors believe to the small amount of copper exposed to the milk when in the tinned copper pasteurizer.

The pasteurization of milk in naked copper resulted in a destruction of at least 80 to 90 per cent of the antiscorbutic vitamin. Since less than 20 to 40 per cent of the loss must be charged to the aërobic pasteurization process itself, a greater portion of the loss must be attributed to copper.

The practical importance of these experiments is that copper is shown to be unsuited for construction in dairy equipment so far as the conservation of Vitamin C is concerned. Tinned copper is likewise unsatisfactory, but no difference was found between pyrex glass and aluminum. Aluminum, therefore, is as satisfactory a material as we have for construction of dairy equipment so far as the destruction to Vitamin C is concerned.

C. A. Stewart, M.D.

PHENYLETHYLHYDANTOIN: ITS USE IN CHOREA: S. W. Marick, M.D., Pittsburgh (Arch. of Ped., Vol. XLVIII, No. 8, August, 1931). Neither the dosage nor the modus operandi of phenylethylhydantoin is entirely agreed upon. It is generally administered until fever and a rash are produced. Most writers state that the result of administering phenylethylhydantoin in chorea is not due to the sedative effect of this drug, but to a specific reaction akin to "serum sickness." Most German writers stress the importance of the fever and rash. In the author's experience neither was a constant factor and improvement followed where both were absent. In fact, they failed to develop a reaction in about one-third of the cases, including some that improved promptly. They are of the opinion that it takes a certain concentration of the drug in the system to produce the toxic rash and fever, and that reaction is no way specific. The drug was not continued beyond two weeks.

Phenylethylhydantoin is administered for general purposes in doses of 0.2 gm. to 0.5 gm. although Bressler advocates doses up to 1 gm. in the more serious diseases of the nervous system. A large dose is generally given once a day.

Usually, between the eighth and fourteenth day, fever and a morbilliform rash appear, first on the wrists, then on the chest, abdomen and limbs. Fever and rash last four or five days and then disappear. As the rash and fever subside, improvement is noticed.

In most of the cases, definite improvement was noticed about one week after the conclusion of the course of treatment.

Over a score of cases of chorea were treated with phenylethylhydantoin. Most of these cases were mild or moderately severe. The results, as a whole, were good.

R. N. Andrews, M.D.

LOSS OF IMMUNE SUBSTANCES FROM THE BODY. II. DIPHTHERIA ANTITOXIN IN HUMAN SALIVA: J. K. Sugg and J. N. Neill (Jour. of Immunol., 20:463, June, 1931). Sugg and Neill report the presence of diphtheria antitoxin in the salivas of "naturally" immune persons and of one toxoid immunized person, demonstrated by the toxin neutralizing properties of the saliva of such individuals. They feel that the toxin neutralization by the immune salivas was due to true antitoxin and not to inactivation or destruction of the toxin by some non-immunological constituent of normal saliva. The action of salivary enzymes was ruled out by control tests with unheated salivas of non-immune persons, and the antitoxin was demonstrated by intravenous injection of guinea pigs with the saliva prior to subcutaneous or intradermal injections of the toxin. The daily output of salivary antitoxin was estimated as equivalent to about 0.07 per cent of the total amount of antitoxin in the circulating blood, at which rate a person would swallow during a year an amount of antitoxin equivalent to approximately 25 per cent of the amount originally present in his blood. Examination of stool extracts failed to detect any traces of the swallowed antitoxin, thus it was either destroyed or absorbed in the intestinal tract. The concentration of antitoxin in the saliva of immune individuals was found to bear a rather direct relation to its concentration in the blood.

C. A. Stewart, M.D.

COD LIVER OIL EMULSIFIED IN AN EXTRACT OF GERMINATING GRAINS: ITS TOLERANCE BY THE INFANT GASTRO-INTESTINAL TRACT AND ITS PROPHYLACTIC VALUE: B. Winston Jarvis, M.D., New York (Arch. of Ped., Vol. XLVIII, No. 8, August, 1931). Deficiency disease prophylaxis becomes more efficient when vitamin sources are combined in a mixture of such tolerance to the infant's gastro-intestinal tract as to permit its early and continued routine use during the very early months of life, during which time hesitancy is usually encountered in undertaking such a procedure with the more common diversified sources of such administration.

An emulsion of cod liver oil in a concentrated extract of the germinating grains of wheat, oats and malted barley is a mixture exceptionally tolerant to the infant's gastro-intestinal tract.

This emulsion contains Vitamins A, B and D; and lacks C, which should be included by adequate dosages of orange or tomato juice.

Although containing 30 per cent by volume of cod liver oil, this mixture yields a Vitamin D potency equal to that of pure cod liver oil. This is probably due to the greater availability in assimilation due to the complete emulsion by the gastro-intestinal tract and also possibly due to a coördinating activity of the A and B factors.

Within the limits of this investigation, this emulsion supplemented by orange or tomato juice apparently obviates the incidence of clinical deficiency diseases when administered routinely and continuously from six to eight weeks of life.

The author urges the greater interest of the physician in a routine use of cod liver oil emulsified in an extract of germinating grains in infancy and childhood for Vitamins A, B and D prophylaxis.

R. N. Andrews, M.D.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

What the Public Should Know About Childbirth. Walker Bourne Gossett, M.D. 290 pages. Cloth. Price, $2.00. Minneapolis: The Midwest Company.

Tables of Food Values. Alice V. Bradley, B.S., Supervisor and Instructor of Nutrition and Health Education, State Teachers College, Santa Barbara, California. 128 pages. Price, $2.00. Peoria, Illinois: Manual Arts Press.

Surgical Pathology of the Genito-Urinary Organs. Arthur E. Hertzler, M.D., Surgeon to the Agnes Hertzler Memorial Hospital, Halstead, Kansas, Professor of Surgery, University of Kansas. 286 pages. Illus. Price, cloth, $5.00. Philadelphia: J. B. Lippincott Company.

TREATMENT OF INJURY BY THE GENERAL PRACTITIONER. Clay Ray Murray, M.D., F.A.C.S., Assistant Professor of Surgery, College of Physicians and Surgeons, Columbia University; Associate Visiting Surgeon, Presbyterian Hospital in the City of New York. 2 Vols., 412 pages of text and 196 drawings by the author. Price, $5.00. Harper and Brothers, Publishers.

This is a monograph in two volumes of convenient size, designed to help the general practitioner in meeting the commoner problems of traumatic surgery. One-fourth of the work is devoted to the treatment of injuries of the soft parts, while the balance deals with fractures and dislocations.

It is a useful guide along these lines, containing much practical advice, tersely told and free from ambiguity. Especially valuable are the sections dealing with the psychology of the patient, the indications for operative interference in bone injuries and the author's own illustrative diagrams.

A few minor changes might be made in later editions. The word "débridement," which really means "unbridling one's horse," should be dropped, and the substitute "épluchage" recommended by Blake is equally misleading, even if literally correct. Why not say "excision"? That is precisely what this author takes pains to describe in detail as the proper mode of cleansing a ragged wound and it is correct and descriptive.

Then the advice to use "the pulmotor or similar mechanical appliance" for artificial respiration is in serious question until we know definitely whether or not these devices cause the air vesicle injury attributed to them by some observers.

But these are remediable matters and do not detract from the general usefulness of the work, which, above all, is to be commended for its evident freedom from cut-and-dried advice and padding of any sort.

Gilbert Cottam, M.D.

AMERICAN PHYSICIANS AND SURGEONS. A Biographical Directory of Practicing Members of the Medical Profession in the United States and Canada. Prepared by James Clark Fifield. Price, $30.00. Minneapolis. The Midwest Company, 1931.

This large volume has been prepared for the use of physicians, hospitals and libraries to supply detailed biographical information regarding reliable and efficient members of the profession. Age, medical education, specialty, articles published, society membership, hospital affiliation are included in the information given.

In the "Foreword" of the volume the editor explains that some doctors are better than others and some are tainted with commercialism. Only those individuals are mentioned who "by reason of their high attainments, skill and reliability are especially entitled to inclusion in such a book." No claim is made that all such are included.

It is explained that final decisions as to inclusion of a name were based on the opinions of the doctors themselves. No doctor can buy his way into the directory.

The editor undertook an enormous task and how well he has accomplished it a reviewer must judge from a perusal of the data about which he is posted. It is probably true, as stated in the foreword, that more errors of omission than commission have been made. A number of names have been omitted which might well have been included. A few errors which need not have occurred were detected: An aurist classified as a general practitioner and two internists listed as graduates of Toronto instead of McGill.

How much of a demand there will be for such a directory at the price is uncertain. We venture the opinion that there will be little demand on the part of laymen in general and few physicians will have enough use for such a volume to warrant the investment.

The thought occurs that it would be well for the A.M.A. Directory to include more information in its volume and thus increase its value.

C. B. Drake, M.D.

MODERN PROCTOLOGY. Marion C. Pruitt, M.D., F.R.C.S. (Ed.), F.A.C.S., Associate in Surgery, Emory University School of Medicine. Cloth. Price $8. Pp. 400, with 233 illustrations. St. Louis: The C. V. Mosby Company, 1931.

This volume rescues Proctology from the esoterica of medicine; it even explains how the specialty got there (see section on hemorrhoids.) One is astonished to learn that the injection treatment of hemorrhoids was practised as early as 1871, by "a man named Mitchell." This obscure and secretive pioneer sold his method to doctors and laymen who went about curing piles, and so were known as "pile curers." Even yet, one may sense the pious fury with which such tactics were met by the profession of that day. By 1914, however, the method was being defended by Sir James Goodheart, consulting physician to Guy's Hospital. Today the method is being taught in the medical schools.

Such conditions as fistula, hemorrhoids, stricture, tumors, prolapse, abscess, et cetera, are taken up in detail; others, such as the diseases of the colon, are less inclusive. Chapters on anatomy, examinations, and anesthesia contain a clear and adequate exposition of the subjects.

E. C. Hartley, M.D.

AN INTRODUCTION TO GYNECOLOGY. C. Jeff Miller. 327 pages. $5.00. St. Louis: C. V. Mosby Co., 1931.

In this work the author discusses etiology, classification, diagnosis, prognosis, general considerations, and clinical considerations of all gynecological conditions. He devotes no time to any form of treatment. The reasons he does so is set forth in his own words in the preface of his work. This work is based on twenty-five years of teaching experience, and it is his object to present something to the student and the beginner which his quarter of a century of teaching has convinced him that they need. The larger works on this subject hardly fit the need of the student, and he feels that the treatment of patients is not the business of the junior student. This is an excellent work for the beginner, and others as well.

A. G. Schulze, M.D.

BEDSIDE INTERPRETATION OF LABORATORY FINDINGS. Michael G. Wohl, M.D., Associate Professor of Experimental Medicine, Temple University Medical School, with an Introduction by Joseph McFarland, M.D., Sc.D., Professor of Pathology, University of Pennsylvania. Cloth. Pp. 320. Illustrated. St. Louis: The C. V. Mosby Company, 1931.

The author says, ". . . this book aims to correlate the laboratory and the clinic. It aims to place a proper evalution upon laboratory reports as applied at the bedside. It aims to omit such tests as are excessively complicated or whose merits are still to be proved, and to emphasize the simpler useful ones that can be performed in his own office by an intelligent practitioner. . . . It aims to emphasize the fact that a laboratory report is only an adjunct to diagnosis, and not the diagnosis itself."

The consistent application of these aims to the twenty-three chapters of the book makes the volume unusually clear and instructive. The chapters deal with the usual subjects of gastric contents, sputum, blood, urine, and so forth, and also with functional tests, acidosis and alkalosis, skin reactions, and pregnancy tests.

E. C. Hartley, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

REGISTERED NURSE and LABORATORY TECHNICIAN desires position in doctor's office, clinic or hospital. References furnished. Write S. Nilson, 4207 Fremont N., Minneapolis, or call Cherry 6977.

CAPABLE X-RAY, LABORATORY, AND PHYSIOTHERAPY TECHNICIAN desires position. Four years of good experience with hospital and clinic. Can also give ether anesthetics. Can furnish A-1 references. Address D-147, care Minnesota Medicine.

LOCATION: Unopposed practice, town of 750. Will lease with idea of selling out if you like the place. No real estate. German mixed farming community. Very large territory. County seat. Write L. J. Alger, M.D., McClusky, N. D.

WANTED—Position as hospital laboratory technician or physician's office assistant. Experience, and good references. Ruth Swanson, Lindstrom, Minnesota, Box 8.

SCANDINAVIAN PHYSICIAN, recent graduate, licensed in Minnesota, desires location for general practice, or assistantship. Available at once. Address D-148, care Minnesota Medicine.

FOR RENT—Doctor's office, formerly occupied for 25 years by physician. Excellent location. Address C. Stevenson, 2500 Riverside Avenue, Minneapolis.

WANTED—Young German Catholic physician as assistant in country practice in Minnesota. Partnership later if agreeable. State qualifications and salary expected. Address D-149, care Minnesota Medicine.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XIV NOVEMBER, 1931 No. 11

THE PRESENT STATUS OF THE TREATMENT OF CARCINOMA OF THE UTERUS*

GEORGE GRAY WARD, M.D., F.A.C.S.
Chief Surgeon, Woman's Hospital, New York; Professor of Obstetrics and Gynecology, Cornell University Medical College, New York City
New York City

IN ACCEPTING the invitation to give the "Citizen's Aid Society Memorial Cancer Lecture" before the Minnesota State Medical Association, I am deeply sensible of the honor conferred upon me, and while appreciating greatly the implied recognition of my fitness to speak authoritatively on the subject of cancer, nevertheless I have had much hesitancy in doing so in view of the comparative small field of opportunity we have at the Woman's Hospital as compared to the great radiological centers in Stockholm, Paris, Münich and New York.

These and the other large centers, with their extensive equipment and full time staffs of scientists trained in physical and clinical research, should be the source from which will emanate the knowledge and extended experience which will ultimately enable us to conquer this most dreadful scourge which is an ever increasing menace to the civilized world. Nevertheless, I do not believe that the establishment of numbers of such centers, geographically distributed as has been advocated, will suffice for treating all cancer patients.

These centers will naturally draw to them a large number afflicted with cancer, but even when such special cancer clinics are greatly multiplied, it will never be possible for them to treat the vast number of sufferers who are to be found in every community throughout the land. It is obvious then that for the many patients who cannot be cared for by these centers we must provide proper adequate treatment in our general hospitals throughout the country, and therefore cancer clinics with the necessary facilities and equipment must be established in these hospitals, and members of the staff must be educated to a proper appreciation of the complexities of this disease and trained in the most approved technic, if we are to give the cancer sufferer a chance for his life.

The cancer clinic then in a general or special hospital I believe has a distinct field of usefulness to the community and is an absolute necessity. Furthermore, in these smaller clinics the thorough and complete carrying out of a technic, or line of therapy and follow-up, may often be more possible than in the larger centers on account of the feasibility of a more continuous personal contact between the clinician and the patient throughout the long period of observation necessary.

Regaud, in charge of the Paris Clinic, recognizes this inevitable need for the establishing of facilities for radiotherapy in gynecological clinics, but stresses the importance of a close liaison between each of these clinics and one of the great radiotherapeutic institutions of the country, with which viewpoint I heartily agree as I believe it is to their mutual advantage.

In the whole medical world there is no more important subject requiring prompt solution than the control of cancer. It has been estimated that there are 360,000 people suffering from cancer today in the United States, and it now holds the second place in the cause of death. According to Hoffman in forty-nine cities of the United States the average increase in twenty-five years has been about 2.5 per cent in spite of modern methods of treatment. In New York City the deaths from cancer last year were 113.9 per

---

*Citizen's Aid Society Memorial Cancer Lecture. Read before the Minnesota State Medical Association, Minneapolis, May 5, 1931.

100,000, while in your own city of Minneapolis the high rate of 142.6 per 100,000 was reached, and in St. Paul, your neighbor, the rate was 121.5 per 100,000.

While cancer is a disease that attacks all parts of the body, about 25 per cent of cancer deaths in women are due to cancer of the uterus and the average duration of life is about twenty to twenty-four months when not treated. We, as gynecologists, are especially interested in cancer of the uterus and it is therefore upon that phase of the subject that I wish to speak.

As cancer of the uterus is a type of the disease which every general practitioner encounters in his daily work, it is largely to him that we must look for the early recognition of the disease and the education of his patients to the importance of promptly seeking a diagnosis on the appearance of suspicious symptoms, and as a large number of these patients are being improperly treated today, either by surgery or radiotherapy, by men who have not a proper conception of the complexities of the problem, I propose to give a survey of the present status of the treatment as we understand it in the hope that a more lucid appreciation of the difficulties of the treatment will prevail.

We must appreciate that the disease originating in the cervix and that arising in the fundus must be considered separately, as the clinical course and result of treatment are quite different in each.

CANCER OF THE CERVIX

Cancer of the cervix by reason of the anatomical conditions is by far the most dangerous form and the most difficult to cure, and is also the most frequent. At the outset we must admit that the results of treatment of cancer of the cervix are far from satisfactory, but at the same time we must appreciate that there has been a considerable gain in the percentages of cures and palliations as a result of modern methods. The treatment today resolves itself into a choice of surgery or radiotherapy (either radium or X-ray), and any of these agents may be combined.

Treatment by Surgery.—The early efforts to eradicate the disease was by removal of the cervix, either by cautery, knife or caustic; then followed removal of the entire uterus, as abdominal surgery developed, with nearly 100 per cent of fatal recurrences. It was not until 1898 when Wertheim introduced his extensive radical removal of the uterus, adnexæ, broad ligaments and upper third of the vagina with enucleation of all pelvic glands that any definite improvement in results was obtained, but at a high cost of primary mortality and morbidity.

The difference between the ordinary panhysterectomy and the Wertheim operation may be best appreciated when likened to a simple mastectomy as compared to the modern radical removal of the breast with the pectoralis muscles, and the thorough cleaning out of the axilla of the lymphatic glands. A simple mastectomy for cancer of the breast would not be considered justifiable surgery today, yet I know that scores of women with cancer of the cervix are being subjected to an ordinary hysterectomy instead of the radical operation, due to the fact that the average general surgeon is not competent, owing to lack of experience and failure, to develop the necessary skill, or he fails to appreciate what the technic of the radical operation should be. I have seen Wertheim and many of the foremost exponents of his technic do the operation, and I have done many myself, and I speak knowingly when I state that I have seen operations that were called Wertheim's that in no way fulfilled the requirements of that technic.

One of the outstanding surgeons in this particular field today is Victor Bonney of London, and I would commend his recent Hunterian Lecture on the "Surgical Treatment of Carcinoma of the Cervix" to those who wish to obtain a proper appreciation of the technic and the difficulties of this formidable operation. The vaginal route was also popularized by Schauta for the wide removal of the uterus and attachments, made possible by the use of the extensive Schuchardt incision. In the first place we must appreciate that the Wertheim operation or the Schauta operation can only be employed in less than half of those applying for treatment, as it must necessarily be limited to the operable class, variable as this class may be in different hands. For the other half surgery offers nothing.

There is no difference of opinion as to what is the best treatment at our disposal for the inoperable class. Radiotherapy is admittedly our most valuable palliative measure, definitely prolonging life and in a small percentage of cases, approximately 12 per cent, accomplishing a cure.

Results with Surgery.—What can we hope to accomplish with the Wertheim operation in the most skilled and experienced hands in this less than 50 per cent of patients with cancer of the cervix that come to us?

Lane-Claypon's exhaustive study, published in 1927, of 80,000 cases in the literature, shows that about 37.6 per cent of five-year cures have been salvaged, but if all the patients applying for treatment are considered, the percentage is 18.3 per cent with a primary mortality of 17.3 per cent.

In the same year Heyman of Stockholm published a masterly study of the operative and radiologic statistics of the leading clinics of Europe and this country. He reduced the figures to a uniform standard. The operative results in twenty clinics showed a total cure rate of 18 per cent and an operable cure rate of 35.6 per cent, but with a primary mortality from the operation of 17.2 per cent.

Weibel in 1928 reports on 1,500 cases operated in Wertheim's Clinic out of 3,165 seen (47 per cent) with a five-year cure rate of 38.4 per cent on those operated, an absolute cure rate of 19.2 per cent on all cases seen, and an average primary mortality of 13.8 per cent.

Victor Bonney's recent report of his results shows that he had seen 450 cases and operated on 284 with a primary mortality of 16.5 per cent, a relative five-year cure rate of 37.8 per cent and an absolute cure rate of 24.4 per cent. His primary mortality in his last ninety-eight cases was 8.1 per cent.

Lane-Claypon states that the extended abdominal operation and radiation are the only methods in serious competition at present. Recently, however, Stoeckel, Adler, and others have been employing the Schauta vaginal hysterectomy combined with radiation, but up to the present the time is too short for any comparative evaluation.

Treatment by Radiotherapy.—In 1929 was published the report of the Radiological Sub-Commission of the Cancer Commission of the League of Nations which gives the guiding principles, technic and results of radiotherapy in carcinoma of the uterus at the three great radiological clinics of Stockholm, Paris and Münich. Every surgeon who contemplates employing radiotherapy in the treatment of carcinoma of the uterus should be thoroughly familiar with the contents of this publication of the League of Nations. It can be readily obtained, published in English, and while the technic employed in these clinics shows considerable variation, the principles of the physical and biological factors involved are in accord, and the results obtained are nearly the same. A perusal will quickly show the novice in radiotherapy that it is no simple matter to employ this two edged weapon efficiently and at the same time safely in the treatment of carcinoma of the uterus.

The technic of the application of the radium in these cases seems so simple that it is difficult to impress upon the casual observer that success and safety depends on the careful study of the location and extent of the disease, of the type of cell and the degree of its maturity, of the general physical state of the patient as to age, blood condition and toxemia, of the careful preoperative preparation of the patient, of the amount of radium used and its distribution in appropriate containers, on the proper employment of screening to cut out the burning rays, on the placing and maintaining of the radium *in situ* where it will destroy the cancer and yet not damage adjacent viscera, on the duration of the application, and the time and dosage of reradiations and deep X-ray therapy, and finally on a careful frequent follow-up. A personal experience in studying the action of radium on this disease over considerable periods of time is essential before one can become competent to properly treat cancer of the uterus with radiotherapy. I say this in spite of the assurances given the practitioner in the alluring advertisements in the medical press, that it is so simple that all he has to do is to send a description of the case and they will send the radium with full directions. Correspondence Courses in radiotherapy are dangerous and we wish to sound a warning as to the serious harm that may result from the indiscriminate application of radium by the inexperienced. I have seen a number of instances of grave permanent damage being done through the careless and ignorant use of radium by those not qualified. The renting of radium from commercial agencies is of course perfectly justifiable, but the knowledge and judgment as to how and when to use it can only be bought by careful study and personal experience and observation in radiological clinics. I cannot do better than quote Regaud's recent warning, "It is necessary to have much experience to obtain from this method of treatment all the good that it may give without the evil that it may do."

The Action of Radium.—The effect produced by the action of radium upon malignant or normal cells should be familiar to all who use this element. Radium does not remove a cancerous growth by destruction of the entire part affected as is accomplished by surgery or cautery, but the gamma rays have a direct selective action on the cancer cells destroying them without injuring the normal cells at the site of the neoplasm. This is often demonstrated in healed cases of carcinoma of the cervix, where the normal shape of that organ may be restored with no trace of the site of the growth. Another action of radium is to cause the proliferation of connective tissue. The connective tissue, contracts with the resulting obliteration in great degree of the blood and lymph supply, producing the contracted, pale looking cervix and funnel shaped vaginal vault, that we see in the ideally healed cases.

Thus we must appreciate that if the dosage suitable for a certain case is used, we will destroy the cancer cells but *not* the normal tissues, owing to the selective action of the gamma rays on the carcinoma, and the greater resistance or toleration of the normal tissues. However, it must be born in mind that if we give much larger doses of radium than is required to destroy the cancer cells, we will also destroy the normal structures and produce extensive necrosis with its resulting septic absorption, hemorrhages, and injury of adjacent viscera with perhaps the formation of fistulæ. Remember also that these unfortunate results of over-radiation with this powerful element are commonly attributed to the extension of the carcinoma, or frequently the action of the radium is blamed and consequently condemned as of no value.

We must see also that if too small an amount of radium is used, or for too short a time, that we may fail to destroy all the cancerous tissue.

Upon the proper screening of the radium depends the elimination of the Beta, or burning rays, which cause extensive destruction of the normal tissue. Various metal containers of different thickness are used such as platinum, gold, silver, or brass for this purpose, and the integrity of the bladder and rectum is accomplished by "distance screening," that is pushing them out of reach of the rays by over distending the vagina with gauze. If inadequate screening has been used, unnecessary necrosis will result.

Too frequently repeated radiations, especially if a heavy dosage for prolonged periods are employed, will result in the so called "late reaction" of radium. Six months, or a year or more, following the initial treatment dense infiltration, pelvic pain, ulceration and discharge may develop which is apt to be attributed to a *recurrence* of the disease, when actually it is the result of an over-irradiation of the tissues with resulting excess of connective tissue formation. This produces a slowly developing obliterating arteritis, and the devitalized structures ulcerate and become a ready prey to infection.

Considerable work has been done in this country in studying the type of cancer cell and the effect of the radium on the several varieties in the hope that a guide to the prognosis might be found. Broders, Martzloff, Greenough, Schmitz and others have made valuable contributions to this subject.

Two main histological types of cervical carcinoma are recognized, the epidermoid carcinoma and the adeno-carcinoma. The epidermoid carcinoma, which is much the most frequent, is divided into three classes according to the differentiation of the type of cell. The epidermoid group is the most common form, and the cell types are designated as the squamous or spindle cell, which is the most mature or "ripe" cell, the transitional or plexiform "midripe" cell, and the anaplastic spindle, "unripe" cell.

The adeno-carcinoma is chiefly recognized by its glandular form of growth.

The importance of recognizing these various types of cancer cell will be appreciated when we understand that they respond differently to irradiation. The "Law of Bergonie and Tribondeau" states that "Immature cells and cells in an active state of division are more sensitive to irradiation than are cells which have acquired their fixed adult morphologic and physiologic characters." The squamous spinal, or mature cell is much the more radio-resistant and at the same time is more slowly growing and the least malignant type, while the embryonic anaplastic "unripe" spindle cell is the least radio-resistant but the most rapidly growing and most malignant type. The transitional or "midripe" cell is midway between these two extremes in responding to irradiation. The adeno-carcinoma of the cervix is fortunately much less frequent (our ratio is about 13 to 1), as it is very radio-resistant and more difficult to cure.

The ability to make a prognosis as to the probability of obtaining a cure by studying the type of cell is open to debate and is not uniformly accepted, as it is evident that many other factors must be taken into account, notably the extent of the disease and the physical resistance of the patient, and also that the ordinary biopsy does not allow of a study of the complete specimen which may show considerable variation in the type of cell differentiation in various regions.

From what has been said it must be evident that the ideal irradiation should be a dosage adjusted to the type of cell we are dealing with and to the extent of the disease, which, while sufficient to destroy all the carcinoma cells, yet should not damage the normal tissues beyond repair. Schmitz has attempted to standardize the dosage according to the cell type, giving a 100 per cent erythema skin dose with combined radium and X-ray for the embryonic unripe cell, and 150 to 175 per cent for the squamous adult cell. He states that the normal tissues will bear without permanent injury an erythema skin dose of 150-175 per cent. The 100 per cent dose may be represented by 3200 milligram hours of radium, 150 per cent by 4800 milligram hours, and 175 per cent by 5600 milligram hours, the latter being the utmost limit for normal tissues.

Large quantities of radium then are not of advantage for internal application. The curative penetration of the gamma rays is limited to about 3.5 centimeters in the amounts that we may safely use. Necrosis of tissue may be caused at the site of application by the gamma rays breaking up into secondary rays from the metallic screens and their action on striking the tissues. We attempt to limit the action of these secondary rays by aluminum or pure rubber protection. It does not avail us to attempt to secure a deeper penetration in an effort to reach the parametrium by greatly increasing the amount of radium in the container, because the intensity of radiation is decreased inversely in proportion to the square of the distance, and the result we would obtain would be a marked and unnecessary increase of the local damage without appreciable gain in penetration.

Toxemia.—The physical condition of the patient may have an important bearing on the reaction produced by the radiotherapy. Many of these patients are anemic and cachectic, and suffering from toxemia as a result of the absorption of necrotic carcinomatous tissue. Frequently they are septic due to a local infection of the ulcerated areas. The immediate result of the radiotherapy in such cases is to produce a severe reaction on account of the absorption of the autolytic and toxic protein substances which have been liberated by the destruction of the cancer cells.

This "radiation sickness" is naturally more severe in those cases that are already toxic and anemic, and this systemic condition prevents the defense mechanism from promoting the prompt healing of tissues. The effect of the radium is to produce a leukopenia and the patient's resistance needs to be fortified to combat this condition. Hence the value of blood transfusions to enable the patient to weather the storm and make a smoother recovery.

External Radiation.—As the beneficial action of the gamma rays of radium is limited to a range of 3 to 4 cm., it is apparent that if the cancer has spread beyond this distance, that the local radium application will not be sufficient to eliminate the disease. Bonney found 43 per cent of gland involvement in his operative cases, and it is to this that he attributes the superiority of surgery.

External radiotherapy by means of the high voltage deep X-ray or by using a radium pack, or "bomb" at a distance, is necessary to attack the disease when beyond the reach of the internal radiation. The use of radium at a distance requires a large amount of radium, 2 to 4 grams, so that the method is not available except in a few radiological institutions.

According to Regaud the use of radium at a distance for external radiotherapy is more desirable than the deep roentgen rays as the short gamma rays of radium are undoubtedly more selective in their action than X-rays. He states that if normal tissue and cancer tissue are exposed equally to radium and the X-rays, it will be seen that while there is an equal destruction of the cancer cells, there is less change observable in the normal connective tissues with radium than the X-ray.

Nearly all radiologists are agreed that the combined treatment is necessary to obtain the greatest benefit, although the results secured in the Stockholm Clinic and our own clinic have been accomplished largely without the X-ray, until recently. Heyman has just published a report of the Stockholm results with the combined treatment which shows a definite improvement over their previous experience, and he states that this technic now will be their routine method. At the Woman's Hospital, we did not have the high voltage apparatus until the past two years, and we are at present using the combined method in the advanced cases.

The Limitations of Radiotherapy.—To find the balance between the dosage necessary to completely destroy the neoplastic cells, and at the same time keep within the minimum dosage which will destroy normal tissues, is the problem that the radiologist must meet. It is obvious that the conditions in each case may vary greatly. The type of cell, the physical characteristics of the growth, the size and condition of the organs affected and the constitutional state of the patient are all factors which must be carefully weighed in planning the dosage and technic best suited for the case under consideration.

Regaud has pointed out that radium is not a cure for every case of cancer. It is with the epidermoid type that the best results have been obtained. The adeno-carcinoma group are more difficult to cure. In the cases where the parametria are involved, the proportion of five-year cures is small, although the palliative results, even in many advanced cases, are of great value in prolonging life and reducing suffering.

Healy states that they have found that 80 to 85 per cent of all their carcinoma of the cervix cases were in the advanced stage.

Results with Radiotherapy.—What can we hope to accomplish in treating carcinoma of the cervix with radiotherapy?

When we speak of a "cure" we must understand we mean that the patient is clinically free of cancer not less than five years after commencing the treatment. In the report of the Sub-Commission of the League of Nations in 1929, Heyman shows that at the Radium-Hemmet, Stockholm, they had treated 737 cases of carcinoma of the cervix with an absolute cure rate of 20.6 per cent and a primary mortality of 2.1 per cent, and a relative cure rate of 23.1 per cent. Twenty-five and one-half per cent of these cases were classed as operable with a cure rate of 40.4 per cent, and 66.7 per cent were inoperable with a cure rate of 13 per cent.

Lacassagne reports for the Radium Institute of Paris on 350 patients treated by radiotherapy alone with an average cure rate of 20 per cent. Forty-two per cent were cured where the disease was limited to the cervix, and 10 per cent in the advanced cases. Regaud in an address given in November, 1929, shows that while their average cure rate for their total cases was 20 per cent, that there has been a steady improvement in their salvage each year from 10 per cent in the 1919 series to 30 per cent in the 1923 series, and the indications as shown by their provisional results point to a still higher percentage of cures in subsequent series.

Voltz reports for the Münich Clinic that 1319 patients were treated from 1913 to 1923 inclusive, with an operability rate of 17.2 per cent. The absolute cure rate for these cases was 15.4 per cent. For the cases with the disease limited to the cervix the cure rate was 40.5 per cent, while for the inoperable group the salvage was 10.7 per cent. Voltz shows that since 1920, when the combined internal and external radiation has been in use, that there was a definite improvement in results by combining radium with X-rays, and in their fully treated cases their absolute cure rate by their recent technic is 21.4 per cent.

The Memorial Hospital in New York results as reported by Healy in 1928 shows 50 per cent five-year cures in the early cases and a 25 per cent relative cure rate. Bowing and Fricke in a recent report from the Mayo Clinic show that of 626 cases treated by radiotherapy only, they had an absolute cure rate of 21.08 per cent, and a relative rate of 23.15 per cent, while with the operable group the absolute rate was 60.86 per cent.

It is also interesting to note that Wintz has reported 17.1 per cent five-year cures by deep X-ray alone in 415 cases, and Adler states by the combined vaginal operation with radium and X-ray that he has a cure rate of 32 per cent in 256 cases with a primary mortality of 3.6 per cent.

At the Woman's Hospital, New York, we have been treating carcinoma of the cervix with radium since February, 1919. In October, 1930, we presented our results for the period from 1919 to 1924 inclusive at the meeting of the

American College of Surgeons. During this period we have seen 259 cases; eight of these were refused radium treatment because of a hopeless condition, and 251 patients were treated with radium. Of these 251 cases the disease was limited to the cervix in 65 (Class I and II, Schmitz), an operability rate of 25.9 per cent. In 186, the disease had extended beyond the cervix (Class III and IV, Schmitz), an inoperability rate of 74.1 per cent.

The ages of the patients ranged from twenty-four to seventy-six years. There were 15 patients under thirty years of age.

Our primary mortality in 361 radium applications was four deaths or 1.1 per 100 applications. There were no deaths in the Class I and II cases.

The five-year end-results of these cases were sixty-four living patients, giving an absolute cure rate of 24.7 per cent and a relative cure rate of 25.5 per cent.

Of the 251 cases, 170 were treated only by the technic we have developed. In this group 79.4 per cent were suffering from an advanced type of the disease (Class III and IV).

Forty-four of these 170 patients of all classes of the disease were living at the end of the five-year period, or 25.9 per cent; of the Class I and II cases (limited to the cervix) of which there were 25, 20 were living or 57.1 per cent; of the 135 Class III and IV cases (advanced beyond the cervix), twenty-four were living, or 17.7 per cent.

In 251 cases treated we were able to trace all but nine, or a completed follow-up of 96.4 per cent. The lost cases were classed as dead of cancer.

ESSENTIALS OF THE WOMAN'S HOSPITAL METHOD

During the first year our technic was not systematized and was therefore variable and was sometimes combined with surgery, but since 1920, we have consistently followed a technic that we have developed. This technic we have previously published in detail, the essential features being: the preliminary building up of the patient's resistance when indicated; an initial test dosage of radium of 2,400 to 4,200 milligram hours is given and we watch the result, subsequent irradiations being dependent on the reaction; a meticulous postradiation care of the patient, with a personal monthly follow-up throughout the entire five-year period, with re-radiations whenever the follow-up examinations disclose evidences of beginning recurrence that are within reach. We have not used the high voltage X-ray therapy as an adjunct until the past two years, so this factor does not enter into the six series reported.

Our experience has led us to believe that improving the patient's resistance before the irradiation in cachectic cases is of distinct advantage in enabling the patient to pass through the period of post-radium reaction safely. Therefore whenever possible every patient with red cells less than 3,500,000 and hemoglobin 50 per cent or below, is given a blood transfusion prior to the application of radium.

We have found that spinal anesthesia, a half dose only being necessary, is more desirable than a general anesthetic in these cachectic cases when inserting the radium. Potassium permanganate douches and an elevated posture are begun at once to favor drainage and separation of any post-radiation slough.

The value of a personal follow-up each month we believe cannot be overestimated. In no other way is it possible to detect early recurrences as manifested by small nodules or erosions long before the patient is aware of any subjective symptoms. Thus we are enabled to give a re-irradiation with tube or needle in time to check the recurrence while in its incipiency.

Re-Irradiations.—The outstanding feature of our method of treatment is this re-irradiation whenever our monthly follow-up inspection reveals evidence of recurrence in the vaginal tract, during the entire period of five-year observation. Nearly 50 per cent of our cases have had repeated irradiations. This is of interest because repeated applications of radium after the initial treatments, are not the usual practice in radium clinics, due to the fear of producing late radium necrosis as a result of the radio resistance of the tissues being increased by over-irradiation. This danger in our belief occurs only if prolonged and repeated applications of a heavy dosage are used. This we try to avoid. Our employment of re-irradiations after the initial treatment is largely for metastatic outbreaks in the vaginal walls or fornices, and consists of a relatively small dosage usually in the form of platinum needles, although should the nature of the recurrence make the use of a contact application more desirable we do not hesitate to use tubes or flat containers. The average dose ranges from 300 to 1,200 milligram hours, depending on the size and location of the metastases. Very few clinics have such a frequent follow-up continued throughout the five years, and it is to this that we attribute our success in saving some cases by discovering recurrences early. We have many instances of successful irradiation of such metastases, occurring two, three, and four years, or longer after the initial treatment, our cure rate for these cases being 26.5 per cent.

We are encouraged to continue this practice in spite of some criticism, as our results seem to justify it, and as several authorities have recently reported the use of this procedure. Heyman in an address before the Royal Society of Medicine in 1929 states that, "We have in recent years in cases of persistent small residua and in the cases of smaller vaginal recurrences made use of intubation of radium needles." The Marie Curie Hospital of London reports that they give repeated irradiations in certain cases with improvement. Taussig in a discussion before the American Gynecological Society last year spoke of the value of re-irradiation, stating that they had caught recurrences in a very early stage and have been able to save and prolong life thereby. In this connection it is interesting to note that in the Münich Clinic the standard treatment is to give a second irradiation eight weeks after the first and if the follow-up shows it necessary a further treatment after an eight weeks interval. Voltz states that no case of theirs survived that did not receive the second treatment two months after the first.

We wish to emphasize the danger of re-irradiating cases with a late radium reaction, under the mistaken impression that there is a recurrence of the carcinoma.

SURGERY VERSUS RADIUM IN CARCINOMA OF THE CERVIX

While exceptional operators like Bonney may attain a slightly higher rate, the highest average figure for the Wertheim Operation in experienced hands is about 20 per cent absolute cure rate. The average absolute cure rate for radiotherapy as reported by the radiological clinics fully equals this. The 50 per cent that apply which cannot be operated upon because of the extent of the disease, have nothing to hope from surgery. From radiotherapy they may look for a 12 per cent cure and definite palliation with prolongation of life in most cases.

Lane-Claypon's study shows that the primary mortality of the radical operation averaged 17.3 per cent for all cases and the more advanced the disease the higher the rate, contrasted with a primary mortality rate of less than 2 per cent for radium, and that on the basis which includes all cases applying for treatment the results obtained with radiotherapy show a somewhat higher proportion of successes than are obtained with surgery.

While the question of radium versus surgery in the operable cases is still debatable, it must be granted that radiotherapy has a strong position in view of the results that have been accomplished by this method. A 57.1 per cent salvage in early cases with no primary mortality, which we have obtained, compares favorably with Bonney's recent report of 38.7 per cent and a primary mortality of 8 to 16.5 per cent with the Wertheim operation, admitting that he operates on many cases where the disease has extended beyond the cervix, and our absolute cure rate of 24.7 per cent is about equal to the 24.4 per cent which he reports.

Regaud in his address given at Liverpool controverts Bonney's claim of the superiority of surgery when it is a question of the invasion of lymph glands, and states that their statistical results justify this claim. By the association of roentgentherapy with the internal use of radium in advanced cases he believes that percentages of lasting cure have been obtained which surgery cannot equal.

Surgery has reached its zenith in the hands of experts after years of experience, and we cannot hope for much further improvement in their results. Radiotherapy on the other hand is as yet in its infancy and we can look forward with confidence to a continued improvement in results as our experience and technic develop.

In summarizing the case of surgery versus radium for carcinoma of the cervix, we may say that while there are differences of opinion as to which method gives the best results in those cases that are in the operable class, there can be no dispute as to the more than 50 per cent of inoperables. For these cases radiotherapy is our most valuable agent today with its undoubted palliative worth and a cure rate of more than 12 per cent. As to what cases are to be classed as "operable" will always be debatable, as the personal equation must enter into the problem. Consequently the comparison of statistical reports from different clinics must be of uncertain value in estimating the results of treatment in this group. Only the final end results of the total cases seen can be accurately appraised.

CANCER OF THE FUNDUS

About 10 per cent of cancer of the uterus originates in the fundus and is usually of the adeno-carcinomatous type of cell. It is more frequuent after the menopause, the mean age incidence being about eight years higher than the cervix cases. It is generally agreed that the ordinary pan-hysterectomy gives such a satisfactory cure rate that it is the method of choice. Lane-Claypon states that the operability is about 80 per cent, and the five-year survival rate is about 60 per cent. However, many of these patients are poor operative risks due to old age, obesity, cardio-vascular disease, deficient renal function, or diabetes. These complications were present in over 50 per cent of our cases.

Radiotherapy must then be relied upon. The Stockholm Clinic report 43.5 per cent cure rate with radium alone in forty-six cases. Healy and Cutler report 58.5 per cent cures in eighty-two cases with radium at the Memorial Hospital, New York. We believe that the ideal method is to combine radium with surgery in these cases wherever possible.

CONCLUSIONS

Progress in the conquest of cancer of the uterus depends not only on advances in technic and therapy, but upon earlier diagnosis. The earlier the case is treated the greater the chance of a cure and with less danger. At present 80 to 85 per cent of patients applying are in the advanced stage. We must look to the general practitioner to make these early diagnoses and to educate his clientele to the importance of promptly seeking advice for suspicious symptoms.

It is just as necessary that men should be properly trained in the treatment of cancer of the uterus by radiotherapy if satifactory results are to be obtained, as that they should be properly trained in surgery.

SUMMARY

1. I believe that the best statistical reports show that radiotherapy is preferable in all classes of carcinoma of the cervix, although I believe that the radical operation will give as good results as radium in the early cases, but at the high cost of primary mortality and morbidity.

2. There is less primary mortality, less morbidity, less loss of time with radiotherapy than with the radical operation for carcinoma of the cervix.

3. The morbidity results of the radical operation should not be forgotten.

4. Radiotherapy in the advanced cases has no rival with a 12 per cent salvage and as a palliative measure.

5. Re-irradiations, when properly employed, are of definite value in curing local metastases throughout the five-year period of observation.

6. A frequent personal follow-up throughout the five-year period is necessary in order to make possible the early discovery of local recurrences, and to permit of prompt re-irradiations.

7. Carcinoma of the fundus is best treated by the combined use of radium and surgery whenever possible.

8. The early treatment of cervical injuries and disease is an important prophylactic measure.

9. The upward trend in the death rate from cancer calls for a compulsory registration of all cases.

10. It is to be deplored that many women with cancer of the cervix are hopelessly doomed, because they are submitted to obviously useless and obsolete surgical procedures, or have been improperly treated with radiotherapy.

11. Finally, I wish to emphasize that if surgery is used for carcinoma of the cervix, only the radical Wertheim operation is justifiable and that this requires experience with a highly specialized technic. If radium is used, experience and a thorough understanding of the action of this powerful agent and a full appreciation of the complexities of its safe and efficient application is essential, otherwise we assume a grave responsibility in not giving these patients a chance for their lives.

> "A little learning is a dangerous thing,
> Drink deep, or taste not the Pierian spring."

REFERENCES

Adler: Jour. Obst. and Gyn. Brit. Emp., 36:335, 1929.
Bonney: Lancet, Feb. 8, 1930, p. 277.
Bowing and Fricke: Radiol., 14:211, 1930.
Broders: Minn. Med., 8:726, (Dec.) 1925.

Farrar: Am. Jour. Obst. and Gyn., 10:205, (Aug.) 1925. Surg., Gyn. and Obst., 43:719, (Dec.) 1926.

Greenough: Jour. Cancer Res., 9:451, 1925.

Healy and Cutler: Am. Jour. Obst. and Gyn., 16:15, 1928.

Heyman: Ann. Surg., 93:443, (Jan.) 1931. Proc. Roy. Soc. Med., 22:801, (Apr.) 1929. Acta Radiologica, Vol. VIII, Fasc. 5, No. 45, 1927. Report of Radiological Sub-Commission of League of Nations, Health 3, 5, 1929.

Hoffman: The Spectator, (Aug. 14) 1930.

Lacassagne: Report of Radiological Sub-Commission of League of Nations, Health, 3:5, 1929.

Lane-Claypon: Report on Public Health, No. 40, Ministry of Health, London, 1927.

Martzloff: Bull. Johns Hopkins Hosp., 34:141 and 184, (June) 1923.

Regaud: Report of Radiological Sub-Commission of League of Nations, Health, 3:5, 1929. William Mitchell Banks Lecture, Liverpool Med. Chir. Jour., 38:1, 1930. Am. Jour. Roentgenol., 21:1, 1929.

Schmitz: Am. Jour. Roentgenol., 10:781, October, 1923. Am. Jour. Obst. and Gyn., 9:644, (May) 1925.

Taussig: Discussion on Sweifel's paper, Trans. Am. Gyn. Soc., 55: 1930.

Voltz: Report of Radiological Sub-Commission of League of Nations, Health, 3:5, 1929.

Ward: Brit. Med. Jour., 2:607, (Oct. 6) 1925. Am. Jour. Obst. and Gyn., 17:1, (Jan.) 1929. Bull. Am. Col., Surg., January, 1929. Surg., Gyn. and Obst., 52:556, (Feb. 15) 1931.

Ward and Farrar: Jour. Am. Med. Assn., 85:159, (July 15) 1925. Am. Jour. Obstet. and Gyn., 11:439, (Apr.) 1926. Jour. Am. Med. Assn., 91:296, (Aug. 4) 1928.

Weibel: Arch. and Gynæk., 135:1, 1928.

Wintz: Deutch. Med. Wchnschr., 11:19, 1925.

Report of the Marie Curie Clinic, London, 1929.

RECENT DEVELOPMENTS IN THE TREATMENT OF DUODENAL ULCER*

Donald C. Balfour, M.D.
Rochester, Minnesota

SURGERY occupies an undisputed place in the treatment of chronic duodenal ulcer. Although it is often difficult to determine the best plan of treatment in certain stages of the disease, in many cases the disease has progressed to a stage at which there is no question but that well applied surgery offers more to the patient from every standpoint than does any other method of treatment. Long-continued disability; intractability to treatment; acute, subacute and chronic perforation; obstruction; recurring hemorrhage, and severity of symptoms, are all clear indications for operation. When this is properly carried out, it will, in a high percentage of cases, give complete and permanent control of the disease, its symptoms, and its complications.

The present practice of postponing operation until such conditions as those named have developed is sound in that there can be no doubt as to the wisdom of operation under such circumstances. I believe that further experience will show that surgical measures can be applied in earlier stages of duodenal ulcer, to the benefit of the patient, particularly in relief of symptoms and protection against the complications of the disease. Frequently the disease has been of long duration, and extensive induration and deformity of the duodenum has taken place. Therefore, gastro-enterostomy is most often the operation of choice because its rates of mortality and morbidity are low, and because it can be relied on to give excellent results when employed in such cases.

Gastro-enterostomy, however, even in cases of long standing, is not always the best operation. It is because of the possibility of earlier operation being advantageous, and because of certain other indications for direct procedures for lesions of the duodenum, that I wish to consider the place which these direct procedures hold in the treatment of duodenal ulcer. The term direct procedure is applied to an operation which includes removal of the lesion or lesions in the duodenum and reconstruction of the pyloric outlet.

There are certain inherent advantages in direct operations for duodenal ulcer, which should always be kept in mind. First, when direct operation is done in cases which are carefully selected, it will be associated with a lower mortality rate than that of any other operation for duodenal ulcer. This statement, although true, is misleading, since gastro-enterostomy is chosen in those cases in which operation is of increased risk, because of the poor condition of the patient, marked obstruction, the presence of extensive inflammatory products, and so forth. Gastro-enterostomy is then a safer procedure than any method of excision and pyloric reconstruction. It would, therefore, be more accurate to say that direct operations are of least risk when they are used in cases in which they can be done safely. Second, the possible advantages of removal of the lesion or lesions must be considered. Theoretically, these are advantages, but in actual fact they cannot be very definite except in those cases in which the ulcer has been associated with bleeding. I am aware of the theory propounded by exponents of partial gastrectomy that an unremoved duodenal ulcer may act as a focus and be responsible for formation of a new ulcer. This possibility must be slight since the most certain result of well performed gastro-enterostomy for chronic duodenal ulcer is permanent healing of the ulcer. Any real value in removal of whatever lesions are present in the duodenum is chiefly confined to the hemorrhagic type of ulcer. Third, direct operation for duodenal ulcer usually permits inspection of the posterior wall, and the information thus acquired as to the extent of the disease is of unquestioned value in the intelligent management of the case. Fourth, in the event of recurrence of ulceration after direct operation with reconstruction of the pyloric outlet, further surgical treatment is not difficult.

The first indication for direct operation for duodenal ulcer, then, is that it can be safely and satisfactorily done. Decision as to the advisability of attempting excision of the lesion varies with the experience of the surgeon; the greater his experience, the larger the number of lesions he will find removable. Primarily, a satisfactory direct operation depends on the situation, size and number of the lesions, the type of perforation, the accessibility of the duodenum, and the amount of scarring which has taken place in the walls of the duodenum. Direct operation, therefore, is usually contraindicated in those cases in which multiple lesions are so situated that they can be removed only with great technical difficulty and consequently increased risk. When a lesion of the posterior wall is large and has perforated deeply into the head of the pancreas, when great deformity of the duodenum exists, when diffuse scarring has narrowed and shortened the first part of the duodenum, when extensive involvement of periduodenal tissues, or gallbladder, or liver, has occurred, or when marked obstruction is present, any attempt at direct operation is usually contraindicated.

---

*Read before the Minnesota State Medical Association, Minneapolis, May 5, 1931.

The type of case in which the direct operation is most commonly employed is in the young patient with a nonobstructing ulcer or inflammatory process of the anterior wall, with marked hyperacidity, and a small, high-lying, hypertonic stomach. In such cases, although gastro-enterostomy will usually give a good result, the danger of recurrence of a lesion in or near the stoma is unquestionably greater in other types of cases. On this score, excision of the lesion and reconstruction of the pyloric outlet have obvious advantages, and they should be done when any operation appears indicated in such cases, even though technically they are difficult. A most important feature of these early cases is that the only visible evidence of pathologic change in the duodenum is an inflammatory process of varying extent, without any true ulceration of the mucosa. Judd has emphasized this condition of duodenitis and the value of wide removal of the inflammatory portion. It is also common to find after removal of these nonulcerating lesions of the anterior wall other lesions, or a lesion in one stage or another, on the posterior wall. This multiplicity of lesions presents a problem which I shall consider later.

Direct operation must always be considered in those cases in which hemorrhage has been an associated symptom. There is no doubt that greater protection against subsequent hemorrhage is afforded the patient if lesions are removed than if they are not removed. This fact often gives rise to an interesting surgical problem, when, because of multiplicity of lesions, or the situation or extent of a lesion, removal becomes an operation of obviously increased risk. I am convinced that when such added risk is real, it is better to perform gastro-enterostomy, with a risk of less than 1 per cent, and with good prospects of satisfactory healing of the ulcer, than to attempt excision. In those cases of hemorrhagic ulcer in which direct operation can be carried out without prohibitive risk, the advantages of visualization of the posterior wall are very important, since it is usually a lesion of the posterior wall which is responsible for serious or fatal hemorrhages. I shall refer to the treatment of such lesions later.

Acutely perforated duodenal ulcers are occasionally best dealt with by direct operation. Simple closure of a perforation, done within the first six hours after the perforation has occurred, practically always saves the life of the patient, but many of these patients will have recurrence of symptoms sufficiently severe to demand subsequent operation. Gastro-enterostomy at the time of the closure often adds unnecessary risk to the operation. Excision of the perforated ulcer with the surrounding inflammatory duodenal wall, and reconstruction of the pyloric outlet can be done, I am convinced, in many cases, without increased risk and with excellent prospects of permanent protection against recurrence. I recently operated on a patient twelve hours after perforation of a duodenal ulcer which had produced almost complete obstruction. The entire inflammatory region could be readily excised, and the pyloric outlet reconstructed so as to provide a large lumen, with complete relief of the obstruction.

The direct operation for duodenal ulcer is particularly well applied in the treatment of gastrojejunal ulceration. The primary requisite in operation for gastrojejunal ulceration is removal of the lesion and disconnection of the gastro-enteric stoma. It is also necessary, however, to consider what is best to control the activities of the duodenal ulcer for which the gastro-enterostomy was done. Usually the primary lesion has completely healed, and it is occasionally advisable to do nothing for it, but a regimen for the patient to live by should be established and, should reactivation of the primary lesion take place, some surgical procedure should be carried out later. In many cases it is possible to prevent reactivation of the disease by a reasonable regimen. It is usually preferable, however, at the time the gastrojejunal ulceration is dealt with, to carry out some procedure for the primary duodenal ulcer, particularly if it is of the contracting type. Excision of the ulcer, with reconstruction of the outlet, possesses great advantage under such circumstances. First, the operation adds little to the risk, and, second, it avoids the serious problem of recurrent ulceration following partial gastrectomy. In the few cases in which gastrojejunal ulceration develops following well indicated and well performed gastro-enterostomy, the patients demonstrate unusual liability to the development of ulcer; this fact should be constantly kept in mind in selecting the type of operation for the duodenal ulcer. It is for this reason, also, that excision and reconstruction of the pyloric outlet has such signal advantage, for should recurrence of ulcer follow, great flexibility in surgical treatment is possible; this is in contrast to the difficulties and restrictions of treatment of the recurrent ulcer in the resected stomach.

The methods of accomplishing direct operations for duodenal ulcer are numerous. Finney gave great impetus to such operations with his pyloroplasty. Many modifications of this have been made with the purpose of meeting the various conditions found. In principle these procedures are the same, and they provide for removal of the lesion, ablation of the pyloric outlet, and reconstruction of the outlet so that an adequate lumen will be permanently established. Wide removal of the anterior portion of the pyloric muscle and the cap of the duodenum, as emphasized by Judd, adds definitely to the prospect of building up a satisfactory outlet. The preliminary steps in the operation are most important, since satisfactory mobilization of duodenum and pylorus has much to do with completing the operation safely. Sutures placed through the pyloric muscle, at the lesser and greater curvatures, serve as excellent tractors and as means of controlling bleeding when the muscle is severed. A very useful procedure is first to open the stomach midway between the curvatures, and about 2.5 cm. above the pylorus, introduce the finger, and examine the posterior wall of the duodenum. Occasionally a lesion of the posterior wall may be found to be so situated, and of such a size, that excision seems unwarranted; gastro-enterostomy thereby becomes the operation of choice. The opening in the stomach can then be closed, and the gastro-enterostomy performed. If it is advisable to proceed with local excision, the finger may be used as a guide, and the pyloric muscle divided just to the inner side of the stay sutures; then the anterior wall is inspected and if a lesion is found, as is common, it is excised with the cautery and the defect closed with two rows of continuous chromic catgut, the suture beginning and ending in the stump of the pyloric muscle. Interrupted sutures of chromic gut reinforce the suture line. The pyloric end of the stomach is then sutured to the round ligament of the liver, as recommended by W. J. Mayo. The risk of this procedure is less than 1 per cent and the results in relieving the patient of symptoms, protection against recurrence of ulceration, and its complications, give it a fixed place in the surgical treatment of chronic duodenal ulcer.

PHLEGMONOUS ENTERITIS

E. Mendelssohn Jones, M.D., F.A.C.S.
Saint Paul

A PHLEGMONOUS affection of the gastro-intestinal tract carries a very high mortality and fortunately is not commonly encountered. In 1906, MacCallum found that only seven cases had been described. Five of these involved the upper part of the small intestine, one the colon and another the whole digestive tract. Since this report the majority of the other recorded cases substantiate the fact that the lesion is most common in the small intestine and particularly the duodenum and upper jejunum.

Phlegmonous enteritis is similar pathologically to phlegmonous gastritis and phlegmonous colitis. It may occur as a secondary manifestation in connection with such conditions as a strangulated hernia or intussusception where mechanical interference with the bowel or its circulation has taken place. All of the cases cited by MacCallum ended fatally. Hughes and Zoepffel each report one case of phlegmonous enteritis with recovery after resection. In phlegmonous inflammation of the large intestine Dowd has a recovery after resection of the diseased bowel. Wilson reports a case of phlegmon of the jejunum with recovery following a lateral anastomosis between the jejunum above and below the lesion.

Primary phlegmonous enteritis is exceedingly rare but the secondary type is more common. It occurs more frequently in the male sex and has been observed between the ages of six and seventy-five. In all cases the existing cause is a pyogenic organism and usually of the streptococcic type.

In discussing phlegmonous duodenitis Black points out that individuals suffering from severe burns and septicemias do, in rare cases, develop ulceration of the duodenum. After artificial production of septicemia in animals, congestion of the duodenum is generally found. These facts and experiments would suggest that a substance has entered the blood, been excreted by the bile and on entering the duodenum has combined with or been split up by certain of the duodenal contents to form an intense irritant poison which has attacked the walls of the duodenum, setting up a violent inflammation.

Arkanzy suggests that traumatism to the abdomen may injure the mucosa of the upper part of the intestine more readily because of its relatively fixed position and thus afford a point of entrance for infection. MacCallum points out that due to the relative freedom from bacteria in the uppermost part of the intestine there might be a point of lowered resistance produced by the trauma and the streptococcus carried to it by the blood stream.

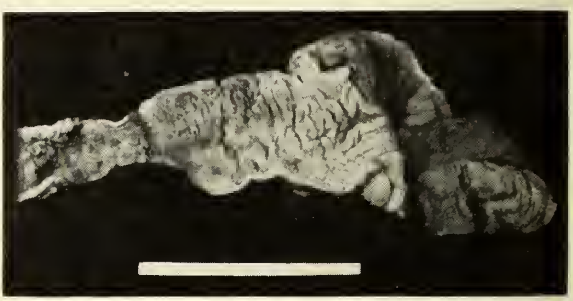


Fig. 1. Specimen of ileum removed at autopsy showing marked thickening.

Zoepffel considers that elderly men are prone to the disease by reason of diminished hydrochloric acid content of the gastric juice, which is therefore less bactericidal and allows injurious bacteria to reach the upper intestine.

Taylor and Lakin report a case of phlegmonous inflammation of the duodenum following the impaction of a fish bone. Fish bones, in their passage along the gastro-intestinal tract, may be arrested at any point and by perforating the mucosa carry infection to the deeper coats of the bowel.

The affected portion of the bowel shows marked thickening and stands out like a rigid tube. It has a velvety appearance and usually is a dark reddish color. There is often enlargement of the regional lymph nodes. There may be patches of fibrinous exudate on the peritoneal coat of the intestine. On section the mucous membrane is seen to be roughened and granular in character with irregular hemorrhagic areas. The submucous and muscularis coats also show considerable swelling, due to the purulent infiltration.

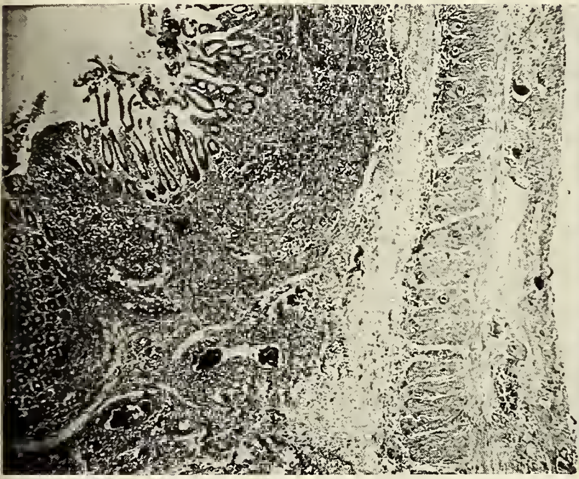


Fig. 2. Microscopic section of the wall of diseased ileum. Note the very decided thickening in the submucosa.

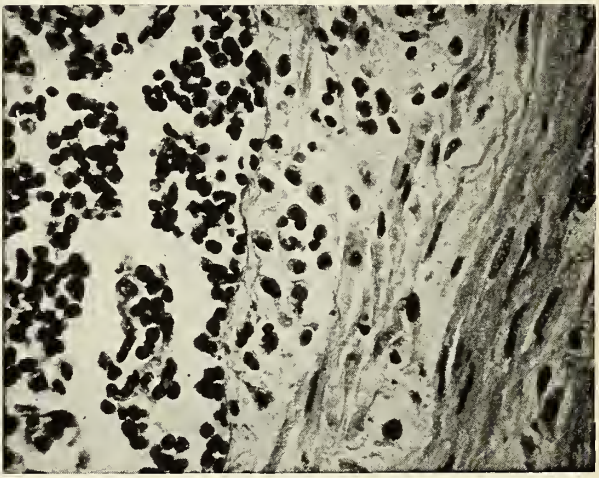


Fig. 3. Higher power section of the submucosa showing infiltration with lymphocytes, plasma cells and polymorphonuclear leukocytes.

The onset of the disease is characterized by cramplike abdominal pain which the patient often has difficulty in localizing. Nausea, vomiting, or both, may be present. The temperature is not usually high, and the pulse rate will vary with the severity of the case. As a rule there is an increased leukocyte count. Abdominal examination may show a slight distention, with tenderness and rigidity. These findings will naturally be dependent on the stage of the disease in which the patient is seen and the location of the lesion.

In considering the question of diagnosis I do not believe one could often form a more definite opinion than that he is dealing with an acute abdominal disorder that calls for immediate surgical intervention. Operation offers the only method of treatment that will benefit these patients. The operation of choice seems to be resection of the affected bowel with anastomosis to restore its continuity. This cannot always be carried out when the lesion is situated in the duodenum or upper jejunum. The prognosis is very poor and this can be improved only by early operation and recognition of the disease.

The first case I wish to present arose as a complication of scarlet fever and would be classed as secondary phlegmonous enteritis.

Case 1.—A five year old girl was admitted to the hospital on January 25, 1930, with a typical case of scarlet fever. Her temperature was 101, pulse 120, no complications. On examination it was noted that the abdomen was normal. Nothing unusual occurred until the night of January 30, when she complained of abdominal pain localizing in the umbilical region. This was followed by vomiting and a complaint of pain in the lower right quadrant of the abdomen. The next day she had four watery stools and developed extreme tenderness in the lower right abdomen. The leukocyte count was 45,000, temperature 101.6, and pulse 120. The urine was normal. X-ray of the chest was negative. Rectal examination revealed tenderness on the right side. I first saw the patient on the evening of January 31, and after examination made a diagnosis of acute appendicitis and advised immediate operation.

The abdomen was opened through a lower right rectus incision. The peritoneal cavity contained a small amount of turbid fluid. There was no odor. The appendix, cecum and terminal ileum were loosely adherent to one another by a yellowish fibrinous exudate. The serosa of the appendix, cecum and terminal ileum was very red, but I was struck by the thick tube-like character of the ileum for a distance of about 15 centimeters from the ileocecal valve. The mesenteric lymph nodes were markedly enlarged. I removed the appendix and closed the abdomen without drainage. The patient died February 2, from a general peritonitis.

At autopsy the intestines were dilated and covered with a fibrinous exudate, there being 200 c.c. of a thick, purulent material in the abdominal cavity. The gastro-intestinal tract was normal except in the region of the cecum. The terminal 15 centimeters of the ileum was markedly edematous, its wall being very much thickened and the mucosal surface roughened and granular in character with irregular hemorrhagic areas. This process ended abruptly at the ileocecal valve. The cecum and ascending colon showed congestion of the mucosa. The ileocecal group of glands were enlarged, measuring 1.5 to 3.5 centimeters in diameter. They were hard in consistency. The peritoneal surfaces were covered in places by fibrinous exudate, and the peritoneal surface over one of the glands showed a necrotic area which might have been the source of the peritonitis. There were a few ulcers of the Peyer's patches in the ileum above the diseased area.

Fig. 4. Shows Gram-positive diplococci in the wall of the intestine.

Microscopic section of the small intestine through the lesion revealed the wall to be markedly thickened. The surface layer of epithelium was absent and there was superficial ulceration of the mucosa. The glands were for the most part intact. The muscularis mucosa was destroyed in some areas by an acute and chronic inflammatory process and the submucosa decidedly thickened and infiltrated with polymorphonuclear leukocytes, lymphocytes and plasma cells. The muscularis and serosa were also diffusely and densely infiltrated with these cells. There was edema of all of the layers of the intestine but this was most pronounced in the submucosa, the phlegmonous inflammatory process being most marked in the submucosa and serosa. The thickness of these two layers was responsible to a large degree for the thickness of the intestine. The diffuse distribution of the inflammatory process and the absence of ulceration were characteristic of a phlegmonous inflammation. Gram stain of the lesion showed Gram-positive diplococci scattered throughout the wall. These were most numerous in the subepithelial tissue. In some areas the arrangement of the organism suggested short chains and it was thought that the etiologic organism in this case was the streptococcus.

Thinking the appendix might be playing a part in the process, I removed it, but of course this was unnecessary.

Looking back on this case and conceding the indication for a resection of the affected bowel, I do not believe it would have been feasible in the presence of the existing peritonitis. The next choice would have been an anastomosis between the ileum above the lesion and the ascending colon, but I am convinced that in this case the best choice would have been to have performed an enterostomy proximal to the lesion. This would have diverted the fecal current as well as a lateral anastomosis and is a much simpler procedure. If the patient survives the acute infection the bowel will undoubtedly heal and resection will not be necessary. The healing of such a lesion without resection is brought out in the following case.

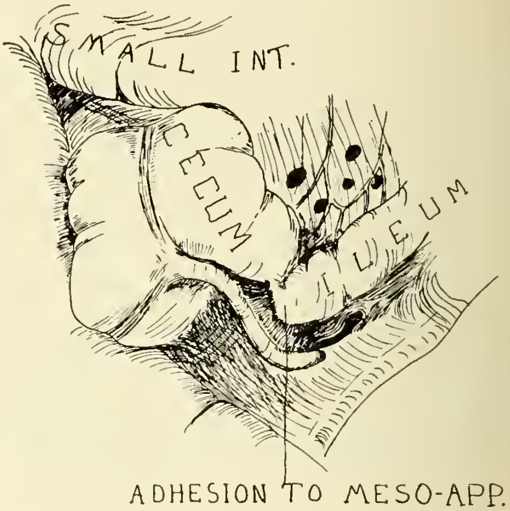


Fig. 5. Drawing showing partial obstruction of ileum and enlarged mesenteric lymph nodes.

Case 2.—Mr. N., a male aged 35, came to my office on December 20, 1930, complaining of pains in the lower abdomen. He stated that he was perfectly well until December 17, 1930. At this time he had some difficulty holding his urine. This was followed by intermittent abdominal pains which began in the lower right quadrant. The night before coming to the office he had a temperature of 101. The only thing of note in his past history was a complaint of lower abdominal distress occasionally after meals.

General examination was negative except for some slight tenderness and rigidity over the lower right quadrant of the abdomen. The urine was normal. The leukocyte count was 9,000; temperature normal. I told him I was not able to make a definite diagnosis but felt that he might have appendicitis. He was told to go home and remain quiet but to notify me if he had a recurrence of his pain. About 9 P. M. that night I was called to see him and he was again having cramplike abdominal pains. His temperature was 99.4°. Abdominal findings were the same as at the first examination.

I made a diagnosis of appendicitis and advised an operation. He finally entered the hospital the next evening. At this time his leukocytes were 15,000, pulse 80, temperature 99.

The next morning the abdomen was opened under spinal anesthesia. A right ractus incision was made. There was no excess fluid in the peritoneal cavity. The appendix was delivered and it did not appear acutely inflamed but a small knuckle of ileum was drawn into the wound with the appendix. There was a partial obstruction of the ileum due to its being adherent to the meso-appendix. The ileum for a distance of 10 to 12 centimeters was thickened, dark wine-red in color, with a glossy appearance to its serosa and had the tube-like characteristic of a bowel affected with a phlegmonous inflammation. The mesenteric lymph nodes were enlarged.

I relieved the ileum, removed the appendix and closed the abdomen without drainage. The pathological report on the appendix was negative. The patient made an uneventful recovery and states that since the operation his bowels are much more regular and that the occasional abdominal distress after eating has entirely disappeared.

This case also falls into the group of secondary phlegmonous enteritis as I believe his trouble was secondary to the partial intestinal obstruction which was found. Because of encountering the condition early in this case and also because of the presence of this very obvious intestinal obstruction I felt that by relieving the obstruction the exciting cause would be removed and the infection would subside. This is probably rather conservative treatment in the face of the bad results reported in the handling of this disease but I am sure there are different degrees of infection here as well as in other parts of the body and I believe we cannot say that any one method of treatment should be used in all cases.

In summarizing the facts gained from the study of this disease I wish to emphasize the comparative rarity of the condition and also the high mortality accompanying it. I believe a correct preoperative diagnosis of phlegmonous enteritis is very difficult but the recognition of an acute abdominal condition requiring immediate surgical intervention is of utmost importance. Resection of the affected bowel, when feasible, is recognized as the procedure of choice. When this is not possible anastomosis has been done between loops of bowel above and below the diseased area. In the very sick cases I believe simple enterostomy, if possible, proximal to the lesion should be the best method of treatment.

BIBLIOGRAPHY

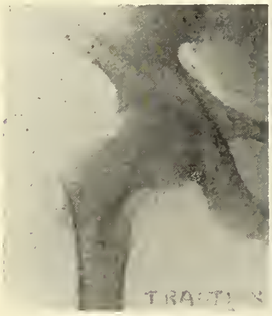
1. Adams, J. E.: Acute primary phlegmonous gastritis. Lancet, 1:292, (January 29) 1910.
2. Black, Kenneth: Two cases of phlegmonous duodenitis. Practitioner, 95:104, 1915.
3. Dowd, Charles N.: Acute phlegmonous inflammation of the large intestine. Ann. Surg., 56:579, 1912.
4. Hughes, E. E.: Primary phlegmonous enteritis. Lancet, 2:860, (October 21) 1922.
5. MacCallum, W. G.: Phlegmonous enteritis. Johns Hopkins Hosp. Bull., 17:254, 1906.
6. Taylor, G., and Lakin, C. E.: A fatal case of phlegmonous inflammation of the duodenum following impaction of a fish bone. Lancet, 2:224, (July 22) 1911.
7. Wilson, J. B. E.: Acute primary phlegmonous enteritis. Lancet, 1:1244, (June 24) 1922.
8. Zoepffel, H.: Heilung der Enteritis phlegmonous durch Darmresektion. Deutsch. Ztschr. f. Chir., 154:266, 1920.

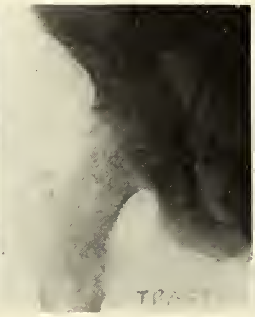
FRACTURES OF THE HIP*

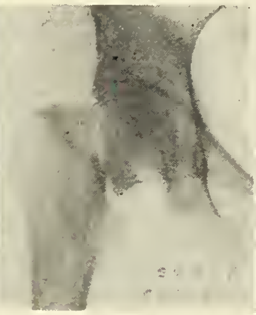
A. R. Colvin, M.D.
Saint Paul

IN 1902 Whitman published a paper entitled, "A New Method of Treating Fractures of the Neck of the Femur." This method, now generally known as the abduction method, and also known as Whitman's method, is now recognized both in this country and in Europe as the standard method of treatment of these fractures.

The treatment of fractures in general consists in the reduction of the displaced fragments to as nearly the normal relationship as possible, and the retention of the apposed fragments until union has taken place.


1


2


3

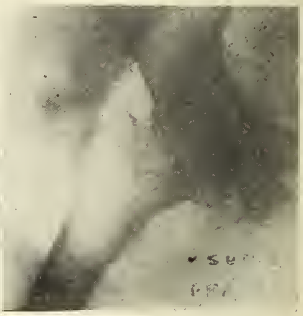

4

Fig. 1. Intertrochanteric fracture of the neck of the fe mur.
Fig. 2. Result of treatment by traction of fracture shown in Figure 1.
Fig. 3. Intracapsular fracture of neck of femur.
Fig. 4. Result of treatment of fracture shown in Figure 3 by Whitman abduction method.

In fractures of the shaft of long bones, perfect apposition of the fragments is not always accomplished by non-operative treatment; nevertheless, union with good functional results is the rule. In fractures of the neck of the femur, union is rarely obtained unless perfect apposition is accomplished, and good function is never obtained unless union results. There is no longer any question as to whether union in these fractures ever takes place; the question is, rather, in what percentage does union take place? Since the advent of the abduction treatment, we can correctly say that at least hope has replaced despair, and optimism is justified. Notwithstanding this, percentages in success means likewise percentages of failure. But at any rate, we can say that by this standard method of treatment better results are obtained than by any other method of non-operative measures.

Perhaps by singling out certain items of experience a better understanding may be had why success and failure occur in a certain percentage of cases.

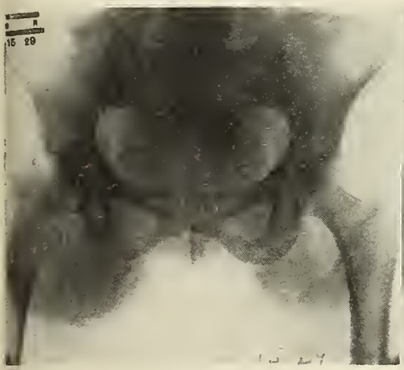
It is well at the outset to establish very clearly the types of fractures in this region. While there may be some theoretical reasoning regarding whether or not some part of the capsule is included in the fracture line, still for practical purposes, the old classification of extra and intracapsular fracture of the neck of the femur is important. We may say that the nearer the fracture to the cartilage covered head, the greater danger of non-union; or, in other words, the nearer the fracture to the trochanters, the far greater likelihood of union, until we come to the intertrochanteric and peritrochanteric regions, when union practically always occurs and greater latitude in manner of retention is allowed.

With the intracapsular fracture, the standard method of treatment is the abduction treatment, which consists of reduction of displacement, apposition of fragments and retention in apposition until union takes place—and after this a prolonged period of protection. Statistically the percentage of union with this treatment may be placed at about 65 per cent. Perhaps those who report as high as 80 or 90 per cent have not had a sufficient number in which to meet the inevitable failures which would reduce their high percentages. This unfortunately has been the experience which has given to me a becoming sense of humility and a recognition of the true state of affairs.

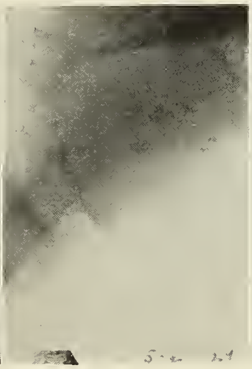
---

*Presented before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 6, 1931.

It would hardly be possible in the time allotted this subject to go into details of treatment. I hope to show rather on the screen what results can be obtained and where the results have not been good to try and indicate why.

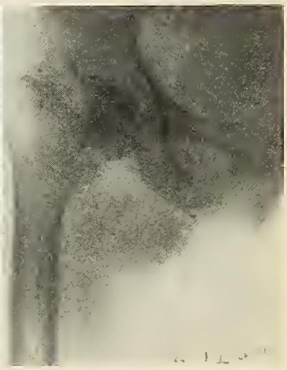


5



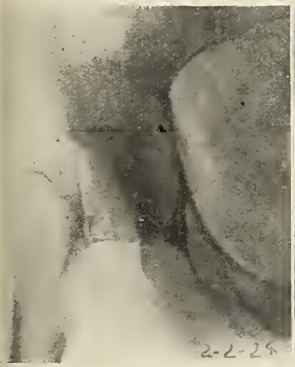
6

7

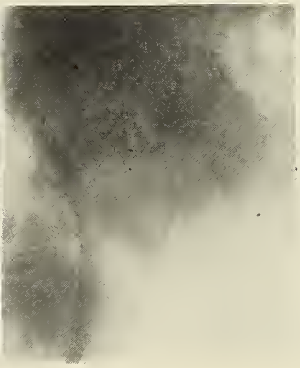


8

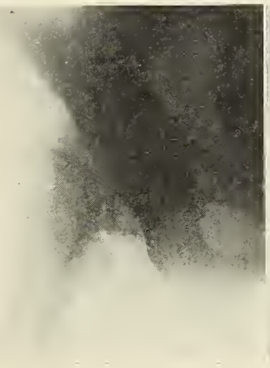
Fig. 5. Intracapsular fracture of neck of femur.
Fig. 6. Reduction of fracture shown in Figure 5 by abduction method.
Fig. 7. Atrophy of neck in case shown in Figures 5 and 6.
Fig. 8. Final result in case shown in Figure 5, showing support obtained by the lesser trochanter impinging on the head. Functional result—patient walks with help of a cane.



9



10



11

12

Fig. 9. Intracapsular fracture of neck of femur.
Fig. 10. Reduction obtained in case shown in Figure 9 by Whitman method.
Fig. 11. Atrophy of neck in case shown in Figures 9 and 10.
Fig. 12. Final result in case shown in Figures 9 and 10, support obtained by lesser trochanter impinging on head. Functional result—poor.

In our experience the failure of union has been due to absorption of the neck, and, except in one case, not to the condition of the head. In this one case, the patient had been afflicted with poliomyelitis in early life, and, his subcapital fracture not uniting, a reconstruction was undertaken. The head was found to be yellow and soft—perhaps necrotic would best describe the condition.

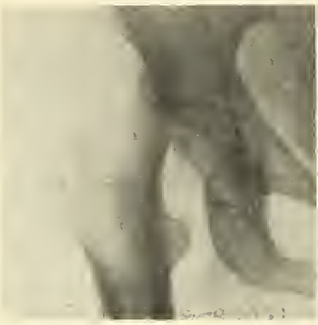
There seems to be some doubt whether the atrophy of the neck is due to some inherent cause in the neck itself, or whether it atrophies secondarily to lack of sufficient osteogenetic properties and non-union in the head. At any rate this atrophy of the neck occurs quite early in some cases. Schmorl says it may become evident in a few weeks. Lorenz puts it very clearly when he says one must not blame the unfavorable anatomical conditions alone for the bad results in fractures of the neck of the femur, and only do so when incomplete reduction and faulty retention can be excluded. Insufficient protection later must also be excluded.

It is not sufficient to take a radiograph before and after reduction, but to take them also during the progress of the case and correct a possible displacement.

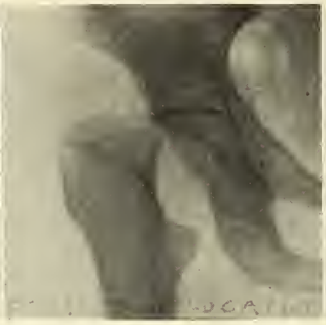
What about the cases in which we do not get union after standard treatment? Briefly, there are various methods of helping these patients, depending upon the exact condition present:

1. Manipulation and reapplication of the cast.
2. Exposing the fracture, freshening the ends of the fragments and again treating with abduction and a cast.
3. Adding to the above a bone peg or transplant.
4. Whitman's reconstruction operation.
5. Backett's reconstruction.
6. Lorenz forking operation.

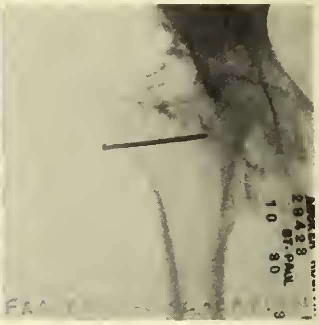
Some of these operations, Whitman's reconstruction, for instance, may be performed as a primary procedure, because in the judgment of the surgeon there is no hope for a functional result in non-operative treatment.



13



14



15

Fig. 13. Fracture dislocation of intracapsular fracture of neck of femur, part of head remaining in acetabulum.

Fig. 14. Case shown in Figure 13 after manipulation, part of head remaining on dorsum of ilium, the other half remaining in acetabulum.

Fig. 15. The result of Whitman's reconstruction operation in case shown in Figures 13 and 14. Functional result—patient walks with a cane.

Before resorting to operative treatment, however, it is well to consider the following facts:

1. Twenty per cent of all of those afflicted with fracture of the neck of the femur die in the first month.
2. Failure in abduction treatment can be followed by various operations later on.
3. Success in bone transplant (pegging) results in selected cases.
4. In 20 per cent of all well treated cases bony union fails and pseudarthrosis occurs.
5. Twenty per cent of all pseudarthroses give comparatively good functional results, due to fibrous union and compensatory support.
6. In numerous cases fibrous union finally become osseous after a greatly prolonged treatment. Perhaps we may use the term delayed union here.

FRACTURE OF THE HUMERUS*

Henry W. Meyerding, M.D.
Rochester, Minnesota

THE automobile has produced an unusual number of serious accidents in which the saving of life is the first consideration, the saving of the injured extremity with good functional result second. The physician who is first to be called in these emergencies must be prepared to meet the immediate effects of trauma and to act to prevent complications. Shock, pain, hemorrhage, injury to nerves, atrophy, stiffness of joints, even infections, frequently can be prevented by prompt modern treatment. Aided by exact diagnosis as to type of fracture, which the roentgenogram permits, results are better and the period of disability is shortened. The value of traction splints was clearly demonstrated in the World War, and is today recognized and recommended almost universally. The simplicity of construction, ease and rapidity of application, and low cost, further make them desirable as standard appliances which hospitals, ambulances, and practitioners should have available.

I favor conservative treatment of fractures, and believe that excellent results are obtained by reduction and fixation when applied before swelling and edema occur. Nevertheless, I do not hesitate to perform open reduction and internal fixation when conservative measures fail, and when I encounter certain fractures which in my experience require these measures. Results of both methods of treatment vary greatly in any given type of fracture, depending not only on the methods employed, and on the skill and experience of the physician, but also on the health, cooperation and environment of the patient. My observations lead me to believe that failure of open operation is mainly due to infection, although both inadequate internal and external fixation play a part. The surgical expert who treats fractures in the modern hospital observes a minimal amount of infection and practically no mortality. He may feel that his excellent anatomic and functional results warrant him in operating for fractures as a routine. The general physician who skillfully carries out conservative or closed treatment is following what is for him a much safer procedure, and his results, in uncomplicated cases, may equal or exceed those of the physician who performs an open operation only occasionally. The best results should come from the experienced fracture teams, surrounded by the most modern of facilities, with patients under constant observation and control.

As an emergency device for fractures of the humerus the Thomas-Murray splint is excellent. Having inspected and palpated the arms to compare bony landmarks, noted any interference with nerve and blood supply, and dressed any abrasions, the ring is slipped up the arm and traction applied by means of adhesive tape or a temporary cuff. The traction splint provides continuous pull, which tends to correct deformity, to prevent injury to the soft tissues and consequently to lessen pain and shock. In a few moments after the physician's arrival the patient is ready to be transported comfortably to home or hospital. Compound fractures are likely to be infected by rubbing and attempts at cleaning applied at the scene of accident. It is better to employ only a sterile gauze pad as first aid; if necessary, later, thorough debridement can be carried out and antitetanic serum administered. The exact injury to soft parts, hematoma, paralysis, and evidence of interference with circulation must be noted. Roentgenograms on which are recorded the date they were made, whether they are front or side view, and the arm involved should complete the record even though reduction has been performed with the aid of the fluoroscope. Later embarrassment and worry are minimized when such records are available, for with the automobile age came also the medicolegal, insurance and compensation age. Following treatment, roentgenograms at intervals of two to three weeks are indicated to determine whether position is satisfactory. The physician should bear in mind, however, that he is concerned with restoring form and function primarily, not anatomic alignment. The roentgenogram has focused attention on perfect reposition, and in attempts to obtain it I feel that much harm sometimes has resulted to soft parts. In deciding on treatment, age of the patient, his physical condition, the type of injury he has sustained, and his economic circumstances should receive consideration. The public expects perfect anatomic and functional results in the shortest possible time. Various agencies interested in the economic phases of treatment and disability demand details of treatment, prognosis, and progress. The wise practitioner will seek counsel early when confronted by the unusually serious and complicated fractures.

---

*From the Section on Orthopedic Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Minneapolis, May 6, 1931.

A factor in the success of any treatment involving fractures of the humerus is the anatomic sense of the physician. Thus, in fractures of the anatomic neck of the humerus the rounded head, facing upward, inward and slightly backward from the shaft, may slip about like a saucer. Fracture of the greater tuberosity of the humerus, by virtue of the pull of the supraspinatus muscle, makes reduction difficult unless traction is made in the direction of the fractured part. The action of the deltoid muscle in fractures above and below its insertion affects the position of the proximal fragment. The teres major, latissimus dorsi and pectoralis major muscles pull the lower fragment forward and inward. The long head of the biceps muscle may be torn or may lie between the fragments. Although the humerus may be broken by direct or by indirect violence, it, more than any other bone, fractures from muscular action. The radial (musculospiral) nerve lies in a groove in close proximity to the humerus as it winds its way downward. It may be injured by sharp edges of bone at the time of the accident, during manipulation, or by pressure of callus, producing wrist drop.

The humerus is one of the most common sites of nonunion. In fractures of its lower third supination forces the lower fragment outward, and tends to cause flexion due to the muscle pull of pronation. When the edge of the bone is sharp and hemorrhage lifts up the periosteum, tension may be increased, forcing the radial nerve against the bone and causing paralysis. Pronation permits the distal fragment to line up more easily, and splinting, the action of the triceps muscle and acute flexion permit retention of fragments. The internal and external condyles lie forward of the axis of the humerus. The carrying angle bends the extended forearm away from the body at an angle ranging between 162° and 178°. The coronoid fossa in front, and the olecranon fossa behind, lie between the condyles, and are necessary to permit full movement of the elbow. Thus, callus, fragments of bone, or malunion, which interfere with the normal shape of the structures named, cause limitation of motion. When supracondylar fractures are improperly reduced, the end of the distal fragment is pulled backward, and the proximal end forward and downward to compress blood vessels and nerves about the antecubital space. Hemorrhage becomes increasingly dangerous as the site of fracture comes closer to the elbow. Therefore, the greatest care is required in preventing intrinsic and extrinsic pressure, or else Volkmann's ischemic paralysis results.

Fractures of the humerus are usually roughly divided into those of the upper end, the shaft and the lower end. Like fractures of other bones, those of the humerus may be simple or compound, or pathologic or spontaneous. Table 1 is a classified list of fractures of the humerus.

TABLE 1

FRACTURES OF THE HUMERUS

- Upper end
    - Fracture-dislocation of the shoulder
    - Of the anatomic neck
    - Of the surgical neck
    - Of the tuberosities
    - Epiphyseal separation
- Shaft
    - Transverse
    - Oblique
    - Comminuted
- Lower end
    - Supracondylar
    - Transverse dicondylar
    - Of the external condyle
    - Of the internal condyle
    - "T" or "Y" fractures into the joint
    - Epicondylar, internal and external
    - Epiphyseal separation

In a series of 114 recently studied injuries involving the humerus, there were twenty-four dislocations of the shoulder, ten of which were complicated by fracture in the upper third of the humerus; twenty-one fractures without dislocation of the surgical neck; one fracture of the anatomic neck; one comminuted fracture of the head; one epiphyseal separation; two fractures of the greater tuberosity; twelve fractures of the shaft; forty-one fractures of the lower third; three fractures of the lower third, with dislocation of the elbow, and eight dislocations of the elbow. Some of the fracture dislocations of the shoulder were of weeks' standing. Sir Robert

Jones, in his presidential address to the International Society of Orthopedic Surgeons at Paris, in October, 1930, spoke as follows:

"Some years ago I was engaged as a witness of a medicolegal case. One of the issues referred to the method of reduction which should be employed in a case of dislocation of the head of the humerus with fracture of the surgical neck. Many distinguished surgeons in 1906 did not know of such an injury. They were astonished to hear that fifty years before the Christian era, Pasicrates, in describing the injury, stated that he preferred to reduce the dislocation and then to allow union of the humerus. Aristion, on the contrary, endeavored to so arrange traction that it would act on both head and shaft simultaneously. Heliodorus supported the contention of Pasicrates. It is of profound interest to realize that in olden times, just as today, schools existed, one in favor of immediate reduction and the other in favor of allowing the shaft to unite before dealing with the displaced humeral head: and so it is always."

In fracture-dislocation of the upper part of the humerus, the dislocation is sometimes unrecognized for months, resulting in permanent partial disability of the extremity, in spite of the most expert reconstructive surgery. Inspection, palpation, and roentgenograms to include both shoulders should be made whenever doubt exists. I have seen and operated on patients weeks after injury, in whom dislocation had not been recognized, although roentgenograms had been taken and treatment had been given for fracture. An attempt to reduce the dislocation should be made as soon as possible, and always with anesthesia. By abduction traction of the arm, and pressure in the axilla with foot or hand, most dislocations are reduced. If one waits for swelling to subside or union to take place, adhesions and scar tissue may fix the head so that great force is necessary, and injury to blood vessels and nerves about the axilla may result. I have found that careful dissection with the knife is required in cases of long standing. Every effort should be made to save the head and replace it in the glenoid cavity, but at times this cannot be accomplished. Once the dislocation is reduced, the treatment is carried out as for fractures of the upper part of the humerus. If internal fixation by Lane plates, bone screws, or Parham bands is employed, active motion can be started immediately, and the functional result will be excellent. This is a type of injury in which early consultation is urged, especially when great swelling, injury to nerves, or infection exists.

Fractures of the anatomic neck are rare, usually are of the impacted variety, and occur in elderly patients. If position is fair, a sling and rest for two or three weeks is ample. When the head is loose and displaced, traction, after manipulation or open reduction, and early movement, are indicated. In cases of long standing, the head, which is loose and is the cause of pain, should be excised. Recumbency in the aged is avoided, and active movement, assisted by the physician, is urged. Forceful movements are avoided as being painful and harmful, but if it is necessary to break up adhesions, this must be done with the greatest care and under anesthesia.

The common fractures of the surgical neck include those that are below the tuberosities, involving the proximal fourth of the shaft. On inspection it may be mistaken for axillary dislocation. The proximal fragment is pulled upward and forward, the lower fragment is pulled forward and inward, and traction is made in the direction in which the proximal end points. The position of choice in treatment is abduction 90°, external rotation 90°, with the elbow at 90°, and the humerus forward of the sagittal plane 30° to 45°. Traction following reduction is maintained in recumbency by any of the abduction splints, such as the aeroplane splint, the Cramer wire splint, or by spica casts. Active motion of the hand and elbow is begun at once. Besides being most useful for maintaining reduction, this position prevents swelling and edema, and the early movement inhibits atrophy and stiffness. Should impaction be present, and the fragments in good position, a sling and plaster of paris shoulder cap are sufficient. Since many of these fractures occur to patients who have severe bodily injuries, recumbency is often preferable to ambulatory treatment. With overhead suspension of the forearm, and lateral traction applied above the elbow or through the olecranon, by means of a rustless steel pin, the physician has more certain control of the patient. Too often bandages and splints lose their efficiency through interference by relatives and friends. The physician is held responsible, irrespective of what the patient may do. Usually fixation for four to six weeks is required; movement of the shoulder is allowed at the end of a month, but movement of the elbow and hand is encouraged from the beginning.

Fracture of the greater tuberosity is frequently complicated by subglenoid or anterior dislocation, and results from direct violence or from shearing force. Treatment is directed toward bringing the arm to a position so that the fragments which are pulled upward and backward may be replaced. This is accomplished by abduction, external rotation, and pressure. When displacement is not great, good results may be obtained by simply a sling. Irreducible fractures are exposed through the posterior Kocher incision, fastened by suture or by beef bone screws, and early movement begun. Abduction external rotation splints are recommended. The treatment of epiphyseal separation is essentially the same.

Fracture of the shaft by direct lateral force is usually transverse. Indirect transmission of force may cause oblique or spiral fractures, and many of the cases of comminution result from extreme muscular effort. The results are usually good, although the shaft is a common site of nonunion, and injury to the radial nerve is not unusual. The presence of wrist drop immediately after injury demands expert advice as to operation. Late paralysis in the region of distribution of the radial nerve is due to pressure of callus, and may disappear in the course of a few weeks, as hardening of callus and shrinking take place. Inadequate fixation, interposition of muscle, and overstretching are factors in the production of nonunion. The commonly used short compression splints and sling are inadequate and lead to many of the imperfect results. They permit too much movement of the fracture, and the weight of the arm, unless constantly supported, tends to produce faulty alignment and to favor edema. Elevation of the forearm in recumbency or supporting it on an abduction splint prevents edema and permits movement of elbow and hand. Too often the apparatus applied extends from the wrist to the site of the fracture or just above it, and the slightest movement of the forearm is transmitted to the fracture. When good apposition of transverse fractures is obtained, a well fitted shoulder spica, extending well onto the forearm, is satisfactory and safe. If there has been great injury to the soft structures, hemorrhage or edema, recumbency is preferred. In overriding and spiral fractures, manipulation or traction may fail to bring about approximation, and open operation may reveal interposition of muscle. Rough handling of these fractures should be avoided, and the physician must be sure that the nerve is intact before treatment, for, if paralysis occurs, he may be held responsible.

TABLE 2

SITUATION OF FRACTURES IN 128 CASES OF ISCHEMIC CONTRACTURE

Situation	Cases
Humerus	56
Radius and ulna	19
Radius	17
Radius and humerus	6
Ulna	3
Clavicle	3
Metacarpals	3
Tibia and fibula	3
Miscellaneous	18
Total	128

Fracture of the lower end of the humerus, in spite of expert care, may end in disastrous complications. The physician, to be successful, must know the exact extent of the injury. Is it an intra-articular or an extra-articular fracture? How do the two arms compare as to carrying angle, swelling, length, movement, deformity, circulation? Roentgenograms, following careful clinical observation, should be made in two planes. If the joint is involved, hemorrhage and fixation tend to produce stiffness, or even ankylosis. Loss of carrying angle, injury to nerves and that dreaded sequel, Volkmann's ischemic contracture, should make the physician regard seriously these fractures of the lower end of the humerus and be guarded in his prognosis. After reduction the position of choice is flexion, for it favors good function in bending the arm toward the body, and aids in most instances to retain the fragments in good position. If marked swelling exists, reduction is deferred until elevation of the arm reduces it. In no case is it wise to force flexion, with hemorrhage and edema threatening to impair circulation. On the other hand, the pulse, color, and temperature should always be observed, and if hematoma or the position of the bone causes interference, the clot is removed and the position of the fracture is changed by open reduction. Watchful waiting, if gangrene or ischemic paralysis threaten, is contra-indicated; a few hours of waiting may mean loss of the usefulness of the limb. The situation of the fracture in 128 cases of ischemic contracture is given in Table 2.

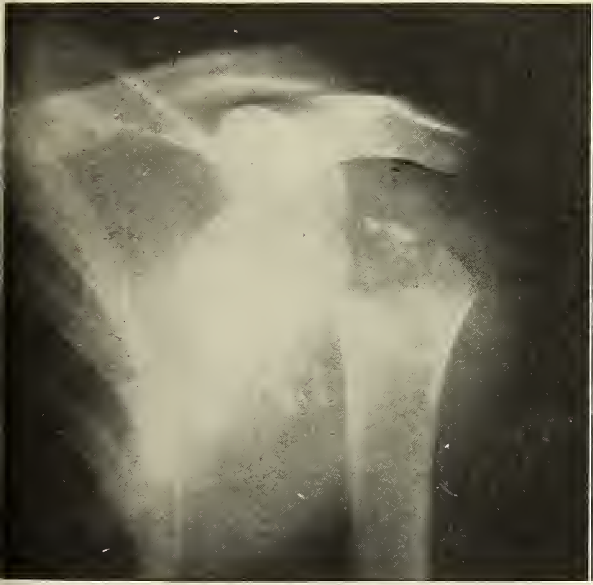


Fig. 1 (Case 1). Fracture-dislocation of left shoulder.

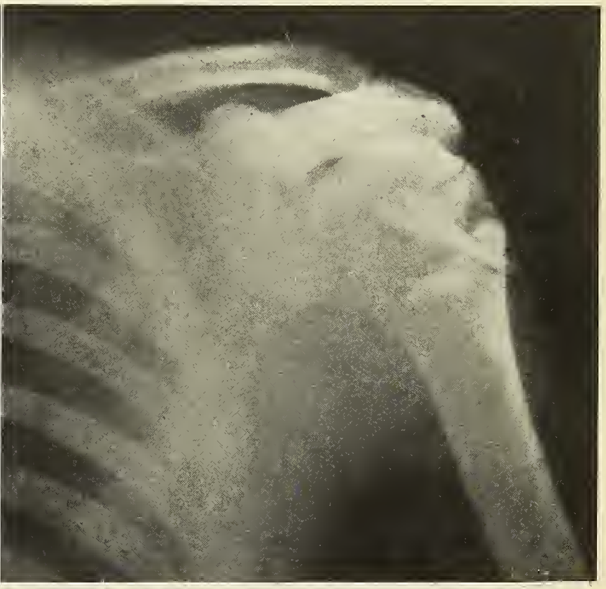


Fig. 2 (Case 1). Fracture-dislocation of left shoulder, reduced.

The most common of the fractures of the lower end of the humerus are supracondylar. They are seen frequently in children, resulting from falls on the hand or elbow with the arm extended; the lower fragment is carried backward, he upper fragment, forward, and the periosteum of the humerus becomes stripped up for several nches. In adults who fall on the stiff, flexed arm, the lower end is pulled forward. Muscular pull maintains displacement; hemorrhage, often severe, increases intrinsic pressure, and if flexion without proper reduction is maintained, or marked swelling is present before manipulation, he stage is set for ischemic contracture. The fracture must be reduced, and the sooner the better. Whenever possible a reliable observer should be engaged for the first forty-eight hours o see that circulation is adequate. Too often stiffness, sloughs from pressure, and contractures are present on the physician's second visit, and nquiry discloses that the patient has suffered great pain, which was relieved by drugs. The cold, blue, swollen, wet hand was unnoticed; he injury has been done, and now months of reatment, with uncertain prognosis, begins. Let t be remembered that Volkmann's ischemic contracture may occur in cases in which treatment has not been given. By hyperextension, traction with manipulation of the lower fragment into position, and then acute flexion, the fracture is reduced and maintained by muscular pull and by the splinting action of the triceps muscle. Supination tightens the pronator muscles, and their pull tends to force the upper end of the lower fragment outward, and also flex the elbow. This may cause pressure against the radial nerve, and paralysis may result; pronation is therefore advisable, for it makes easier reduction and retention and avoids injury to nerves. Adhesive plaster passed over the shoulder and over the forearm is frequently used to maintain flexion, or the Jones cuff suspended from the neck. They permit inspection, palpation, and loosening if necessary. Light plaster of paris moulds cause less pressure and are perhaps preferable. Early, active motion is essential in preventing stiffness.

Transverse dicondylar fractures involving the joint require similar care. Fracture of the condyles and capitellum, if not displaced, require immobilization in splints or plaster for two to four weeks. When satisfactory reduction by manipulation fails, open operation and suture, or a bone screw, are indicated. The ulnar nerve may be injured and early suture or late transplantation may be advisable. The arm is placed in the position at which the fragment seems to hold its place, and a well fitted splint or cast is applied and is allowed to stay in place for two or three weeks. At the end of this time, gentle, active movement aided by the physician, with the splint off, results in restoration of movement.

"T" and "Y" fractures, and intercondylar and multiple fractures resulting from falls on the elbow, often drive the olecranon up between the condyles and split the humerus. Moulding and traction are indicated, with flexion. Skeletal traction, with a rustless steel pin thrust through the olecranon, and abduction casts or splints, give better results than if the arm is held at the side. Open reduction, with fixation of fragments, is only for the expert, working with the most careful technic. The earlier motion can be started, the better the motion which will result. Epicondyles, if displaced, may be sutured or removed. Epiphyseal separations may be reduced by manipulation, and traction may be used if flexion fails to maintain them in position. Immobilization is maintained for three or four weeks.

Nonunion of the humerus requires the care of an expert bone surgeon who is accustomed to a technic which involves many special instruments and which exacts the utmost in aseptic precautions. After exposure, the ends are freshened or excised; the medullary cavity is drilled out, and the ends are brought together. A properly shaped graft is removed from the tibia and is applied as a massive inlay, held by bone screws. Cancellous bone, curetted from the tibia, is then forced about and between the freshened ends. The periosteum and the muscles are then pulled snugly over the region of the graft. Finally, the skin is closed without drainage. A plaster spica cast to fix the humerus and support the forearm is used until union is firm.

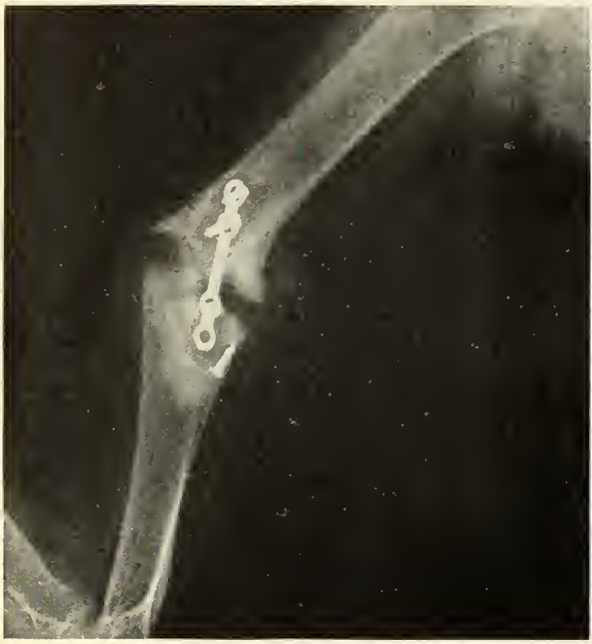


Fig. 3 (Case 2). Nonunion of right humerus, with loose Lane plate and pseudo-arthrosis.

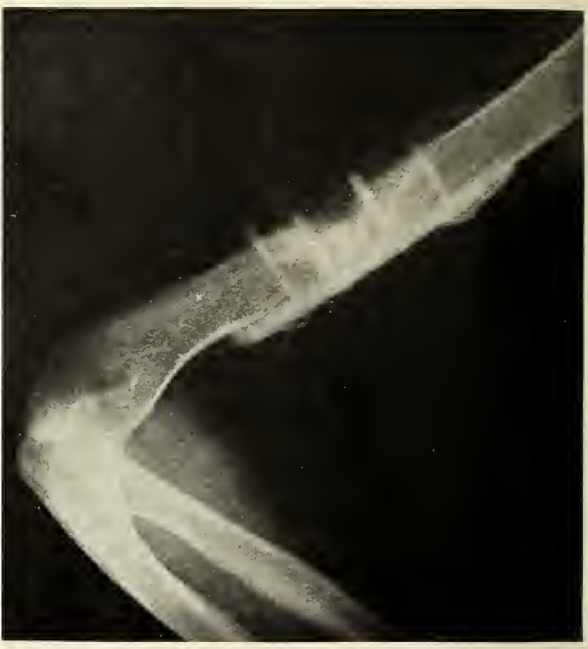


Fig. 4 (Case 2). Autogenous bone graft held in place by beef-bone screws six months after operation for nonunion of the humerus.

REPORT OF CASES

Case 1.—A man, aged twenty-five years, was injured in an automobile accident and was taken to the hospital unconscious. Emergency treatment was given, and roentgenograms were taken, which gave evidence of a split in the head of the humerus, and dislocation. Traction was applied, and four days later, when his general condition was satisfactory, he was referred to the clinic. Open reduction and internal fixation, by means of three beef-bone screws, held the fragments in anatomic position. He wore an abduction cast three weeks, at the end of which time he returned home, able to abduct his arm 60°. Thirteen months following the accident he reported that function of the shoulder and arm was normal (Figs. 1 and 2).

Case 2.—A woman, aged twenty years, sustained a compound fracture of the middle third of the humerus twenty-two months previous to her visit to the clinic. After fixation in splints for two months she had been operated on for delayed union; a "bone graft and four hole steel plate" were applied. Nonunion and drainage resulted; the plate became loose and she came for an opinion as to the value of further operation. The Wassermann test was negative. The Lane plate and screws were removed; the pseudo-arthrosis was excised, and an autogenous bone graft, held by four beef-bone screws, was applied. External fixation consisted of an abduction spica cast extending to the and. The patient left the hospital twenty-four days fter operation, and the cast was removed at the end f three months, when sound, bony union and good unction existed (Figs. 3 and 4).

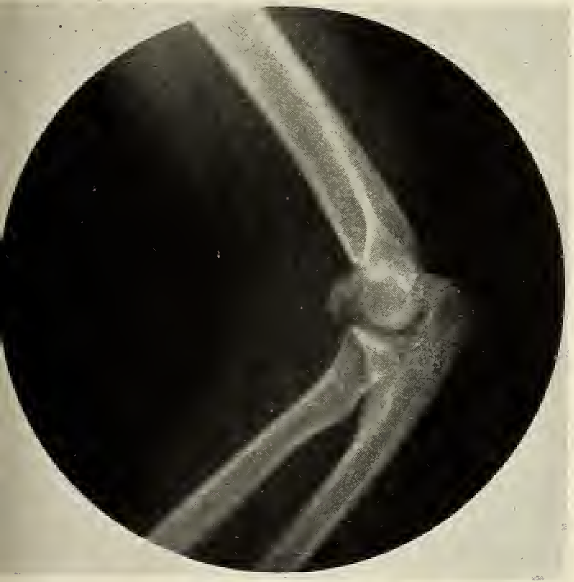


Fig. 5 (Case 3). Lateral view of fracture of capitellum of the humerus.

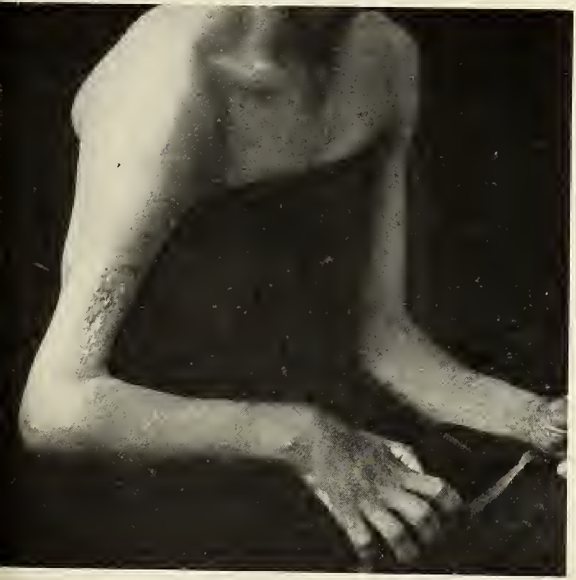


Fig. 6 (Case 4). Volkmann's ischemic contracture and scars rom slough of skin.

Case 3.—A nurse, aged nineteen years, fell, injuring er elbow. Roentgenograms were taken immediately, nd a diagnosis of fracture of the capitellum was made. It was thought that an open operation would be necessary, but manipulation under anesthesia was first tried and the fracture was easily reduced. The patient wore a sling, and in two weeks had practically full flexion and extension (Fig. 5).

Case 4.—A boy, aged nineteen years, sustained a supracondylar fracture of the right humerus six years previous to his visit to the clinic. He had been treated by manipulation, flexion, and a wire splint. The next day, the hand had been black and swollen, and his physician had taken off the dressing for an hour; then he had reapplied the same splint, and had left it on two weeks. A hand splint had then been applied and worn for a month, but in the distribution of the radial nerve paralysis had occurred and numbness had been present. A slough from pressure had appeared on removal of the first dressing, and the marks of it show clearly in Figure 6. Stiffness of the elbow, wrist, fingers and hand had resulted, which had persisted in

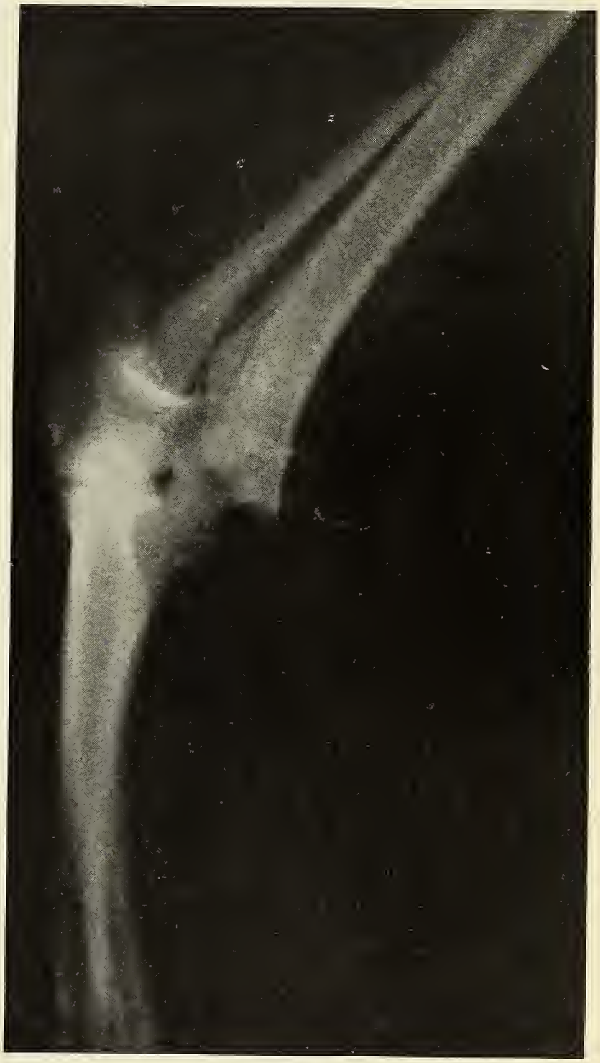


Fig. 7 (Case 5). Comminuted fracture of lower end of humerus.

spite of any treatment. Osteotomy of the humerus for malunion and tendon transplantation for injury to the radial nerve was performed. The patient left the hospital on the sixteenth day. Five months later his physician reported good function.

Case 5.—A woman, aged thirty-one years, was thrown from an automobile, striking on the right elbow. She was taken to the hospital and roentgenograms gave evidence of a comminuted fracture of the elbow of the "T" type, with a split of several inches in the humerus. Open reduction was immediately performed, and traction was made by wire through the olecranon. The arm was supported on the abduction splint, and she left the hospital on the eleventh day. The splint was taken off at the end of four weeks, a sling was used, and physical therapy was begun. She has returned to her usual occupation, has good flexion, with motion of 70°, and is still improving after nine months (Fig. 7).

SUMMARY

Fractures and dislocations of the humerus should be immediately reduced and retained by apparatus which permits motion of joints and avoids edema and pain. Abduction traction splints are most serviceable, easily made, economical, and should always be available. The condition of the patient, in this age of serious accidents, may require measures to save his life first, but emergency traction by simple means during transportation and after are best. A knowledge of anatomy is indispensable, for muscular pull, conformation of bone and distribution of nerves must be taken into consideration. The conservative methods are favored, but when they fail early operation is to be resorted to by one accustomed to it. Active motion is to be encouraged and gently assisted by the physician, when, in his judgment, it is safe. Passive and forceful movement of stiff, painful joints is harmful. Fractures of the surgical neck and upper end of the humerus are not infrequently complicated by dislocation. Roentgenologic examination before reduction and in the course of treatment is urged. One should always be on guard for injured circulation, especially in fractures about the elbow. Flexion, when marked swelling occurs, should be avoided. Volkmann's ischemic contracture may occur without use of splints or casts.

FRACTURES OF THE ANKLE JOINT*

J. S. Holbrook, M.D.
Mankato, Minnesota

In this necessarily brief discussion of fractures of the ankle, a few principles of treatment will be mentioned in the hope that they will be of help in the care of these cases.

The ankle has a hinge-like motion, and that only, normally. The very strong internal and external lateral ligaments hold the foot very firmly. The tibiofibular ligament holds the bones very stoutly together, and thus prevents lateral motion between them and the astragalus. There is a very strong attachment of the fibula to the astragalus by ligaments, which are so firmly attached that the astragalus remains attached to the fibula and is displaced with it in severe ankle injuries. Dickson[2] says that this is the key to the whole situation.

In the ankle joint the weight of the body is carried by the small articular surface between tibia and astragalus, when the flat surface of the former glides over the rounded convex surface of the latter. This near mortice joint is so firmly held by the capsule and its thickened portions—the internal and external lateral ligaments—that there is practically no lateral motion. The lateral motion which we get in this neighborhood is between the os calcis and the astragalus.

Up to about 200 years ago, the injuries of the ankle were considered dislocations, and treated as such. However, Pott and Dupuytren began to teach that these dislocations were often accompanied by fractures. These men did some wonderful work, considering that their diagnoses had to be made from the appearance of the ankle and examination by touch and manipulation. For the past thirty-five years the roentgen ray has been increasingly used, and the films have become so uniformly good that the pendulum has swung so far that the injuries about the ankle joint now are estimated by the amount of fracture.

Cotton and Berg[1] brought out the point that these injuries are really dislocations, often accompanied by fractures, as taught by Pott and Dupuytren about 200 years ago, and that they should be treated with this idea in mind. They classify the ankle injuries as:

1. Outward dislocation—Pott's Fracture.
2. Inward dislocation—reverse Pott's fracture.
3. Backward dislocation—Cotton's Fracture.
4. Upward and forward dislocation.

In the first class, the outward dislocation, the foot is displaced outward, the internal malleolus is torn off, and the fibula fractured about two inches above its lower end. Reduction of this fracture by forcing the foot inward will bring the fractured bones into proper position. One cannot over-correct it.

In the second class, the inward dislocation carries the foot inward and upward, and the external malleolus downward. The treatment consists of forcing the foot downward and outward, pushing it into place and maintaining it in this position.

In the third class, the backward dislocation of the foot with a fragment torn from the posterior part of the tibia is reduced by pulling the foot forward, and fixing it in dorsal flexion.

In the fourth class, which consists of a crushed lower end of the tibia with upward displacement, the fibula is seldom fractured. The upward thrust shortens the shaft of the tibia one-fourth to one-half of an inch, the amount depending upon the severity of the fall. There is a spreading of the ankle joint due to rupture of the tibiofibular ligaments. There is so much swelling and deformity that the diagnosis should be made by the X-ray. The treatment consists in correcting the displacement under an anesthetic, molding the fragments of the comminuted tibia into place, and extending the foot by use of a Sinclair skate, or otherwise; and maintaining corrected position much longer than external and internal dislocation-fracture. If reduction of fragments cannot be maintained, open reduction and nailing may be necessary.

I here will report the case of a boy, aged seventeen, who slid off the roof of a barn, landing on his feet. He claims that he fell 30 or 40 feet. He suffered a fracture of the left os calcis, and a comminuted fracture of the lower end of the right tibia, with the usual upward thrust, and shortening of one-third of an inch. Two attempts were made to maintain reduction in this case, but it could not be done until the fragments were nailed onto the shaft. Quite a large piece of the articular surface was found entirely separated and was removed. This boy made a good recovery, having almost normal motion in both feet.

---

*Read before the Minnesota State Medical Association, Minneapolis, May 6, 1931.

The second hint in treatment comes from Edward Holman Skinner of Kansas City,[4] who has devised a mean of estimating the amount of displacement and probable functional disability which is likely to result from a given ankle fracture. The restoration of the astragalus to its normal relation to the tibia is the result to be sought. The weight bearing line of the tibia should pass directly through and bisect the articular surface of the astragalus. A line so drawn on a film will show the amount of displacement of the astragalus.

Skinner remarks "that even though the apposition of the fragments may not be perfect, the functioning result will be satisfactory, if the weight bearing line is restored to normal alignment. Apposition of the fragments may be sacrificed to the restoration of function."

The third suggestion for treatment is by Fraser B. Gurd,[3] who tells of the use of the pillow splint at Montreal General Hospital. This splint has been used in that hospital for twenty-five years with gratifying results in fractures of the ankle. In his paper he says: "In our Clinic, following reduction, the leg is placed in a pillow splint. For this purpose a moderately deeply feathered pillow is required, covered with a pillow-slip made of some strong material. The leg is placed upon the center of the pillow, with the latter projecting about 6 inches beyond the heel. The pillow is made to surround the leg, commencing about or, better, above the knee, and firmly secured by means of safety pins placed in the long axis of the limb. Working from above downward toward the ankle joint, safety pins are placed in this way at short intervals. In this manner, lateral and circular compression is exerted. This is of value in limiting the swelling, and forcing, by gradual pressure, if reduction has been incomplete, displaced fragments into position. This is particularly useful in overcoming separation of the tibia from the fibula."

The foot is held by the pillow in dorsal flexion. The advantage of the pillow splint is that there is no danger of ischemic paralysis. It can readily be opened up for observation, and re-adjustment may be made several times the first few days. No extra board splints are put within the pillow case. X-ray should be taken through the pillow. The foot remains in this splint until the swelling is gone, when a circular plaster of Paris bandage is applied without employing padding. This remains on for ten days. It is then bisected, the posterior part being retained for a splint. Light massage and diathermy, baking, and active motion are employed for six days. Then another cast is applied with a heel, one inch thick, strapped on.

Gurd says, "By this method many return to work a week or two after the injury." He claims more perfect results than by other methods.

The fourth method of treatment of fractures is that advocated by Böhler. I understand that he always uses a local anesthetic, consisting of 10 to 20 c.c. of a 2 per cent novocain solution, injected directly into the break. I have used this with satisfactory results on many occasions.

His method of taking care of fractured ankle is to have the patient lie with his injured leg hanging over the end of a table. He molds the fragments into place, and applies a posterior splint of plaster of Paris, molded about the malleoi, and then a circular plaster of Paris bandage over that. The leg is not shaved, and there is no padding used, the plaster being put directly on the skin. After this has set slightly, a piece of strap iron, one-eighth of an inch thick and three-fourths of an inch wide, is bent so as to project one-half inch below the heel, and extend up the sides of the leg internally and externally. At the upper ends are cross-pieces to aid in holding the iron firmly. This is incorporated in the cast by several thicknesses of plaster bandage. In many cases the patient is encouraged to walk within two hours after the accident.

I have not used this method in an ankle, but did in a case of fracture of the tibia in its middle third. The patient did very well. While at the hospital he walked around the bed many times, but when he returned home, after three days, the family doctor and the patient's friends persuaded him that it was a very risky thing to do—so he used crutches. However, he immediately went back to his work as a stock-buyer, and lost but four days work, after the leg was put into a cast. He was very much pleased with the result, and felt that his disability had been greatly shortened by allowing him to get about.

The method carried out by Lorenz Böhler allows the patient to continue his occupation and saves him much time and expense. He claims for it that there is but little swelling, and the patient is very comfortable.

To recapitulate:

1. Always make free use of the X-ray before and after reduction, taking antero-posterior and lateral plates.
2. An anesthetic should always be used at the time of reduction.
3. Consider ankle injuries as dislocations with possible fractures.
4. Reduce the dislocation, and as a rule the fracture is reduced with it. You cannot overcorrect it.
5. Draw a line on the X-ray plate, through the tibia in the direction of the weight bearing line, and see where it crosses the astragalus. It should be through its center. If not, get a better reduction.
6. The pillow splint may be used to good advantage.
7. Familiarize yourself with the Böhler method, because it is very valuable, and no doubt will become more popular the more it is used.

BIBLIOGRAPHY

1. Cotton, F. J., and Berg, R.: Ankle fractures; new classification and new class. N. Eng. Jour. Med., 1929, cci; 753-60.
2. Dickson, F. D.: Fractures of the ankle. Jour. A. M. A., Chicago, 1928, xci; 845-49.
3. Gurd, F. B.: Treatment of fractures involving the ankle-joint; with special reference to the use of the pillow splint and early weight bearing. Ann. Surg., Phila., 1928, lxxxviii; 260-65.
4. Skinner, E. H.: Roentgenographic interpretation of functional reduction of fractures; methods applicable to the ankle, wrist and elbow. Jour. A. M. A., Chicago, 1929, xcii; 693-94.
5. Wenger, H. L.: Visit to the Clinic of Dr. Lorenz Böhler. Jour. Med. Soc. N. Jersey, Orange, 1930, xxvii; 882-84.

GENERAL PHYSICAL EXAMINATION*

E. L. Tuohy, M.D., F.A.C.P.
Duluth, Minnesota

THE morning program readily shows you that I have been given a totally impossible subject, "physical examination." Fortunately, the brilliant and gifted speaker, Professor Luten† from St. Louis, has preceded me and has given to you my introduction. You have seen how carefully he has pointed out the extraordinary value of a proper history, a proper evaluation of the symptoms offered by the patient who comes to consult you, and has discussed the paucity of evidence that is often accumulated after exhaustive routine examination. Those who shall follow me will present to you that objectivity which shall give you peace and calm, whereas I shall give you that subjectivity which may perhaps test your patience.

The public have been greatly charmed for many decades, if not centuries, by objectivity and examination. The quacks have ever been eager to adopt it. So today we see newspaper advertisements of machines in front of which the patient may sit or stand or lie as a vigorous individual may peer through this machine and do the lying afterwards. Many of us have had to deal with individuals of various grades of intelligence, not to say of acquaintance with our language. I might even give this to you in semipoetic form:

Mister da Doc
I been a sic,
Maka da pic,
Pain in the bell,
It hurts like ——.

Finish this up according to your desire—poetry or prose! Translated it means that this individual has been told by some neighbor that if he would come to me, or to a doctor thus chosen, we have an occult machine which may be turned toward him and an X-ray be made of his interior. From that (giving no credit whatever for the use of intellectuality in attempting to extract his story or to properly proportion it), he will be able to find out the cause of the internal discomfort which happens to be in the instance gastro-intestinal.

Out of such basic attitudes comes the notion held by many of our leaders that routine examinations will tell us all needful things. That this is held even in high places is evidenced by the effort on the part of the A. M. A. and this State Association and others to carry on a worthy endeavor intended to popularize periodic health examinations. It is part and parcel of the same notion now carried on by many public laboratories or health extension institutes based upon the belief that by taking a certain series of notations, measurements of one sort or another, one can arrive at an estimate of the status of the individual and judge accurately his life expectancy. I need not bring into the argument at all the obvious fallacy involved in the sending of a specimen of urine to this or that laboratory, and from that magic fluid some static sage may conjure up your future or expeditiously divine the type of pruning needful for your family tree. At least we know the chief thing that happens is the diversion of some $25 from the local community to Chicago or some other city which boasts of such talent.

It is said that the great Voltaire was so very critical of our profession that he thereby evidenced his extreme interest in it. The modern Voltaire is no doubt George Bernard Shaw, who is so critical of us that he exhibits his true appreciation of our possibilities. Critical as was Voltaire of our profession, he was even more critical of the church; he was rather roundly condemned by both. So it is stated that at the time of his death a priest was sent for who came in. Still in his doubting and quizzical attitude, Voltaire said, "Who are you?" The priest replied, "I come from God." Voltaire, half dead, wheezed, "Your credentials, please."

So what are my credentials? Whence have I come? Well, I have practiced medicine rather intensively for twenty-five years, and it just happens that I have been associated most of the time with unusually well poised confreres, trained in various specialties. I know therefore how valuable routine examinations may be. I began as a laboratory man. I had the first modern fluoroscope brought into the northern part of this state. I did the first spinal puncture, so far as I know, that was done in my county and gave the first antimeningococcic* serum intraspinally in Minnesota. My active interest in laboratory routine has been far too intensive to lead me to condemn the practices that my successors, dealing with objectivity, are going to present to you, but I am here to tell you that 75 to 80 per cent of the folks that come to us will have no surcease, no comfort, no benefit whatever from any or all isolated and extensive detail. Such will give great comfort and satisfaction to 10 per cent of complainers. For 15 or 20 per cent, they will help profoundly in ruling out organic diseases, but if they apply spinal punctures and cystoscopies and such forbidding routine upon a mass production industrial basis, they will drive many neurotics to the shelter of the Christian Science fold or to the sublime vacuity of chiropractic.

---

*From the Department of Medicine, The Duluth Clinic, Duluth, Minn. From stenographic report of address before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

†Professor Luten's address on Cardiology and the General Practitioner appeared in the October number of the Journal.

I therefore enunciate a statement of principle with which I am sure most of you will agree: We must all begin with as distinct an understanding of the complaints the sick individual presents as it is humanly possible to get, and then we may apply such tests and technical adventures as judgment and experience dictate, which may result in a maximum both of information and benefit. First of .all find out why the individual presents himself to you and listen attentively to his story. The real art of medicine is the art of getting a history. Professor Luten has already propounded that thesis logically and convincingly. This is the soundest of medical tenets; ancient and modern. Permit me to read to you briefly from the remarks made by Professor Charles P. Emerson, well known teacher of Indianapolis, in talking on this same subject:

> "In this age of standard output and mass production, you cannot deal with medicine and its problems as one would with fabrics, wood or steel. Patients are not alike. Medical students come to admire the consultant who will see a patient for two minutes, then refer him to the various sets of departments, eye, ear, nose and throat, psychiatric, roentgenological and otherwise, and then take five minutes in which to round up the situation, and treat the patient. This may be good business but it is very bad medicine. I do not even believe it is good business. It does not work."

He says that the more laboratory work he has done on patients the more necessary was it to find out why he had any at all and how to interpret it. I tell you a great deal of the cost of physical examination is not the fault of the medical profession but the fault of folks who fancy that unless you institute a long sequence of objectivity, they aren't getting anything for their money.

That great medical philosopher of Minnesota, William James Mayo, some years ago enunciated the proposition in my presence, "Why should people have to pay you or any doctor who needs a great series of equipment and a lot of detailed examination in order to help him make up his mind? Why isn't it just as valuable that you are able to use your experience, your judgment, your analytical powers and give the man that opinion, without this objectivity?" Like many philosophers who speak so vividly, so honestly and so correctly, of course he went right on to apply that principle in his practice at Rochester and developed a remarkable line indeed, including Dr. Braasch. (I single out the cystoscope not because of any inability to appreciate its virtues but because of an inherent horror of its vices.) There is a very faulty assumption not only by the laity but many physicians that the Mayo Clinic and other good clinics throughout the world magnify and emphasize routine examinations. I wish to assert that no clinic can survive that has not early learned that success is unattainable without the utmost use of the human intellect, and the keenest analysis of that subject most difficult to understand, namely, the human consciousness. It is God's greatest gift to man; and, by all odds, the greatest tyrant inducing disturbances which bring 75 to 80 per cent of our patients to us suffering from this or that. They are usually called neuros. I introduce the painful subject only to dismiss it. It is that type of individual that challenges the medical profession today, from the standpoint of the expense of having an examination, the effort involved in finding out his difficulties, the lack of knowledge of world affairs on our part, the inability to plumb the depths of social relationships, insulating so many of our finely trained fellows from their patients. And what a great disadvantage! Because a man with good personality and intelligence even though a faker or a quack establishes an emotional contact that binds irrespective of logic or reason. Therefore, learn to sit down and listen to your patient's story. Write it out as it is given to you. Keep records.

---

*The late Professor Frank Wesbrook, just back from New York, had been given some of the earliest product by Flexner at the Rockefeller Foundation.

It is not easy to get a history. Many people camouflage their real complaint. They lead you astray. They have seen other doctors and they wish to know what you think about their problems. They give you a story that leads away from the main issue, which is probably fear of cancer or fear of going insane or fear that the mother-in-law may not go home. One needs to be observant and skillful; to check them up, criss-cross back and forth. But write down your gleanings; some of these are very general impressions.

Let me cite an illustration! It has only recently come into our consciousness that there is such a thing as hypoglycemia occurring in normal individuals under emotion or strain. They present a curious syndrome. It may suggest gastric or duodenal ulcer and on occasion is associated with tachycardia. I recall a man who had spent three weeks with a cardiologist trying to get straightened out. His story emphasized a sudden tremulousness and weakness with fast heart beat; he felt very, very uneasy. When he came to the doctor he had only the story of these things. I wrote all that down; but I didn't tumble to what he had. I went ahead and examined and talked to him on the basis of a neuropath with cardiac signs. The next day, in looking over my chart, I said, "Here we are. What was the matter with me? Where was my thinking apparatus?" I called this man back and said, "Did you have a very good night the last two nights?"

He said, "No, I get that same thing. It wakes me out of my sleep."

In general, people do not awaken from neurotic discomforts. I said, "I know what is the matter with you and I totally overlooked it the other day. Take some chocolate or a chocolate bar, put it down by your bed, and just as soon as you feel that coming on, take two or three bites and your distress will go away. Try it." It worked like magic. My explanation satisfied both of us. It is not my purpose to present a monograph upon the subjective manifestations of entities as real as hypoglycemia. Rather do I wish to borrow from the popular province of radio the illustration of "tuning in." I am sure we saw cases of tularemia prior to an epoch making observation of an interne at St. Mary's hospital. He found the first case of tularemia in Duluth by reading the *Journal of the American Medical Association* and possibly MINNESOTA MEDICINE. We now know we are "tuned in" on tularemia. Likewise on Malta fever. Diagnostic leads orient the historical approach. The danger of "seeing" a diseased gallbladder in every well nourished dyspeptic simply illustrates the incalculable need of judgment and honesty. Questions may be less leading than informative: "Did you have a sore on your finger before you had the lumps up here (axillary)? The tularemic man then divulges the rabbit episode. "Did you, sir, before you had this feeling that we are talking about (hypoglycemia), go without food?" "Yes, I went without food. I was on a considerable bat the night before. The next day I thought I wouldn't eat anything and my wife said, 'You had better go out and get some fresh air'." He walked rapidly for four miles, exhausted all the glycogen in his body, had this hypoglycemia, called a physician and was three weeks in the hospital under the combined medical and lay impression of "acute cardiac dilatation." The episode should not appear in medical annals but in certain addenda to the Wickersham report!

I spoke of judgment, and what a thing is judgment! How does one get it? You get judgment by reading, by coming to meetings like this, watching patients who are operated upon, cultivating acquaintance with autopsies and pathologists. One gets it through contact with his fellow-men; it comes in a good many forms. I think you see what is on my mind. I introduce these other men. I ask you to listen attentively to their warnings and exhortations. Specialistic technic is most valuable, but do not reach out for it until you have gone as far as is reasonable with simple processes of analysis and a thoroughgoing exhaustive review of your patient's major complaints. Do not try to buffalo the patient or yourself by directing her attention away from a sore tongue to a malposition of the uterus or laceration of the cervix, because, as a rule, she is right. You should watch these folks with burning, painful throats that you call neuros. You should keep in touch with the best medical meetings of the country. For instance, I asked an observant colleague, "What was the best thing you got out of the meeting of the American College of Physicians at Baltimore in March of this year?" The answer came back, "Minot (without the help of Murphy) gave a talk on the overlapping of pernicious and secondary anemia." Some months previously some of us had hit upon the same notion, that some patients with painful throats and sore tongues even without classical blood (laboratory) changes indicative of primary anemias, are revivified when treated with large doses of iron and raw liver given in cold tomato juice. Thus have I used up all my time in my discursive approach to the patient. This is just as well. You are as familiar as I am with the technic of examinations.

THEELIN AND THEELOL

The announcement three years ago of the separation of a potent ovarian hormone from the follicular fluid by Allen and Doisy marked a distinct step in the direction of progress. The product had an estrus-promoting activity that could readily be assayed. Other investigators also have been engaged in the study of ovarian hormones, and medical journals carry accounts of a considerable number of products, each designated by some trade name. A new era was ushered in when Doisy announced, at the thirteenth International Physiological Congress in 1929, the isolation of a hormone in crystalline form. The Council on Pharmacy and Chemistry of the American Medical Association adopted the name "theelin," selected by Doisy, as the nonproprietary designation to be used in New and Non-official Remedies for the ovarian hormone made by the process of Doisy. Last year Doisy and his co-workers recorded the discovery of a second estrogenic substance in the urine of pregnant women. It is a triatomic alcohol for which the name theelol has been proposed. Theelin appears to be approximately twice as active as theelol in adult spayed rats, whereas, theelol is six or seven times as active as theelin in immature female rats. It is too early to speculate on the possible uses of these two substances. (Jour-A. M. A., July 4, 1931, p. 33.)

HEALTHOLA DIABETIC FLOUR NOT ACCEPTABLE FOR N. N. R.

Healthola Diabetic Flour, according to the label on the package, contains protein, 49.73 per cent; fat, 24.56 per cent; carbohydrates, 15.92 per cent, and contains no sugar or starch. According to the advertising of the distributors, Healthola Diabetic Flour Co., Huntington, W. Va., "Healthola is a flour made from an imported vegetable." No statement of the identity of the product is contained on the package or in the advertising nor is there a statement that in the body the protein contained in the product is largely converted into carbohydrate. The Council on Pharmacy and Chemistry finds Healthola Diabetic Flour unacceptable for New and Non-official Remedies because its identity is not declared on the label and in the advertising; because its name is not descriptive of the composition but therapeutically suggestive instead, and because the claims are misleading and unwarranted. (Jour. A. M. A., July 11, 1931, p. 103.)

FROM N.N.R. TO THE U.S.P.

Of the forty new products in the United States Pharmacopeia X, thirty-one came from New and Non-official Remedies. No better recommendation can be given for "N.N.R." (Jour. A. M. A., September 26, 1931, p. 931.)

INTRAVENOUS UROGRAPHY*

William F. Braasch, M.D.
Rochester, Minnesota

IN the differential diagnosis of abdominal disease a generation ago, surgical lesions of the kidney were often overlooked, but with the development of cystoscopic and allied data they have been recognized more frequently. The necessity of excluding the kidney in cases of doubtful diagnosis, and the fact that it is better for the patient to have a renal lesion discovered by cystoscopic examination than by abdominal exploration was realized slowly. Patients generally were not submitted to urologic examination because of the comparative inaccessibility of such examination and the technical difficulties involved; nevertheless the desirability of a method which would eliminate these factors and which would be available for general use was obvious.

The solution of the problem was made possible by the discovery by Rowntree and his associates that a large amount of sodium iodide given intravenously was excreted by the kidney in sufficient amounts to permit visualization of the urinary tract by the roentgen rays. The application of the method was not widespread, because visualization of the renal pelvis and ureter was uncertain and inadequate, and because of the systemic reaction of many patients to the presence of free iodine in the system. It remained for German chemists to discover that iodine when organically combined was better tolerated and afforded clearer visualization of the urinary tract. Roseno of Cologne was the first to make this discovery, but unfortunately the agent he suggested was toxic. Shortly afterward it was found that another iodine-bearing compound called "selectan" was even more opaque to the roentgen rays and was not toxic. As the result of the combined work of Swick, Binz and von Lichtenberg, this compound was brought out in the form of a substance called "uroselectan." At the same time Bronner of Cologne discovered another form of organically combined iodine which was similarly nontoxic and afforded even sharper visualization when employed intravenously. This substance was called "abrodil." Both uroselectan and abrodil have been placed in the hands of the American profession and have been widely used. The former has been named "iopax" and the latter "skiodan."

Intravenous or excretory urography offers the medical profession an opportunity to obtain data concerning renal conditions in a comparatively simple and practical manner. Although in many cases it will not be sufficient in itself to determine the exact condition of the upper part of the urinary tract, and additional data will be necessary to complete the diagnosis, nevertheless it will often give a better idea of the existence of a renal lesion and its nature than could be obtained by any other method short of cystoscopic examination. It should be employed in every case in which there is any question of the existence of renal disease other than nephritis, and it will undoubtedly lead to the recognition of renal lesions which are now overlooked.

The method will be of great help to the urologist, since it offers the possibility of obtaining additional data which were not available by previous methods. Its greatest value will be in the possibility of investigating the upper part of the urinary tract in cases in which cystoscopic examination is physically impossible or inadvisable. Such cases will include deformities involving the urethra or bladder, contracted and markedly diseased bladders, obstructions to the ureter, conditions otherwise inaccessible, and many cases in which the patients are children.

When intravenous urography is employed in general diagnosis it will be of greatest value in the recognition of urinary stasis, and in the identification and localization of renal and ureteral lithiasis. There should also be less difficulty in recognizing the frequently overlooked disease, hydronephrosis, and in identifying and localizing shadows in the renal and ureteral areas which were suggestive of lithiasis. The determination of the functional capacity of the kidney involved, as well as that of the opposite kidney, should be of exceptional value to the general surgeon.

TECHNICAL CONSIDERATIONS

The technic of administration is comparatively simple. The patient is given the usual preparation for roentgenography, and the iodide compound is injected slowly either by the gravity or syringe method, with the patient in a recumbent position. At present, skiodan is the medium of choice because its administration is not accompanied by untoward symptoms and since it gives clearer visualization than iopax. It is ready for use in sterile ampules in 25 c.c. of a concentrated solution. In recent months iopax has been modified, and claims have been made that it offers unusually good visualization without causing subjective symptoms.

---

*From the Section on Urology, The Mayo Clinic, Rochester, Minn. Read before the Minnesota State Medical Association, Minneapolis, Minnesota, May 4 to 6, 1931.

Attempts have been made to concentrate a maximal amount of the excreted substance in the renal pelvis by both excretory and mechanical methods. The former may be somewhat abetted by limiting the fluid intake for several hours prior to urography. Retention of the medium may be attempted by placing the patient in the Trendelenburg position and by placing a compression bag over the lower part of the ureters for ten minutes before exposure.

Intravenous urography is contra-indicated only in case of advanced renal insufficiency or general weakness. I have employed it, however, for several patients whose blood urea was 100 mg. for each 100 c.c. of blood and for others who were feeble, without observing any ill effect. A serious objection to the method is the exorbitant cost of the iodine compounds which are now available. It is to be hoped the cost will be brought to a level which will permit of their more general use.

In describing the advantages which intravenous urography offers in general diagnosis, it should be noted that there are a number of factors which militate against its universal employment; they are as follows: (1) visualization of the renal pelvis is frequently too dim for exact interpretation; details of calices, particularly the minor calix, are frequently quite obscure; (2) visualization of the ureter is often fragmentary and inadequate; (3) exact urographic interpretation is difficult without considable experience; (4) it is necessary to have cystoscopic data in order to obtain a complete diagnosis in most cases and to exclude vesical conditions, and (5) reflex inhibition of renal excretion interferes with appraisal of renal function.

INCOMPLETE VISUALIZATION

Unfortunately, the intravenous urograms do not afford a uniform degree of visualization. For some unknown reason, apparently an idiosyncrasy, kidneys which are otherwise normal will excrete a variable amount of the iodine compound injected intravenously so that the renal outline is frequently too dim for interpretation. Complete failure of excretion may result because of the reflex action from intrarenal stone, and this may be confused with lack of function. With renal insufficiency, as indicated by blood urea of 100 mg. or more for each 100 c.c. of blood, excretion of iodine will be inadequate to visualize the renal pelvis. Frequently one side will be fairly well seen and the other will be too dim for interpretation. One must not expect to have the pelvic outline as clear as that observed with retrograde urography. It is often necessary to inspect carefully the various films taken at different periods after injection in order to obtain an approximate idea as to the outline of the pelvis. In all such cases retrograde urography and allied cystoscopic observations should be employed.

UROGRAPHIC INTERPRETATION

The difficulty of interpreting the intravenous urogram may offer a serious impediment to its universal employment. Exact interpretation is dependent on wide experience in recognizing the normal and abnormal outline of the renal pelvis. Although in a large number of cases the condition will be easily recognized, there will be many in which interpretation, without the benefit of wide experience, may be difficult. Furthermore, additional data such as can be obtained only by means of the cystoscope may not alone be desirable but necessary, in order to obtain accurate interpretation of the urograms as well as a complete evaluation of the conditions present. The data obtained from the intravenous urogram are often only complementary to the cystoscopic examination, and the ability to recognize its limitations is necessarily dependent on a wide urologic experience.

HYDRONEPHROSIS

In most cases in the diagnosis of hydronephrosis, intravenous urography is preferable to retrograde urography (Figs. 1, 2 and 3). In spite of every precaution that may be taken there is always a possibility of infecting the kidney by means of retrograde catheterization and urography when retained urine is present. Danger of infection is completely obviated by intravenous urography. I have never observed any irritation in the renal pelvis as a result of retained medium injected intravenously, although some patients with hypersensitive bladders will complain of vesical irritation. Another advantage of intravenous urography is the coincident visualization of the opposite side, permitting comparison of the two renal pelves. As a result it has been found that the incidence of bilateral hydronephrosis is undoubtedly greater than had been previously supposed. Pyelectasis in the opposite kidney may not show any symptoms. Intravenous urography is also preferable because it usually enables one to determine more accurately the site of ureteral obstruction. It is obvious that surgical treatment depends largely on whether the obstruction is in the lower or upper part of the ureter. With retrograde urography the injected medium may stop at the level of the kidney and there may be no evidence of it above the point of obstruction. This may occur with a number of lesions such as neoplasm of either cortical or pelvic origin, occluded renal tuberculosis, ureteral angulation and extrarenal pressure. If there is sufficient renal tissue to secrete iodine, intravenous urography offers the only means of determining the nature of the lesion causing such obstruction.

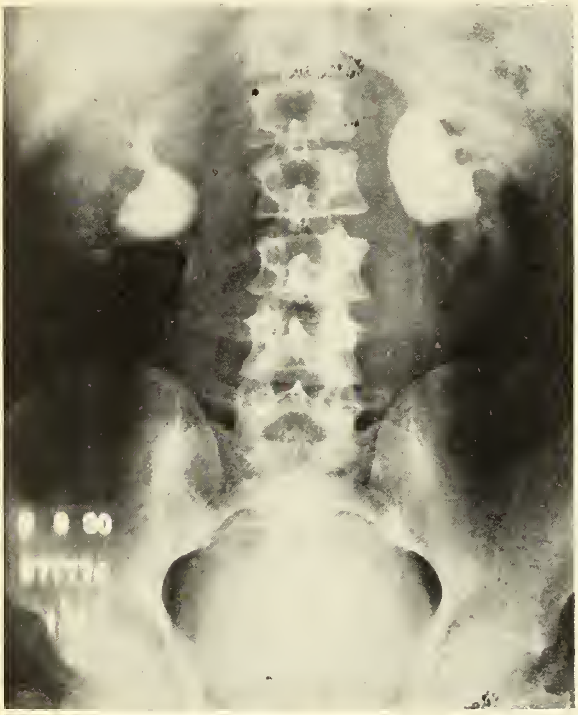


Fig. 1. Intravenous urogram, showing bilateral hydronephrosis, and obstruction at ureteropelvic juncture.

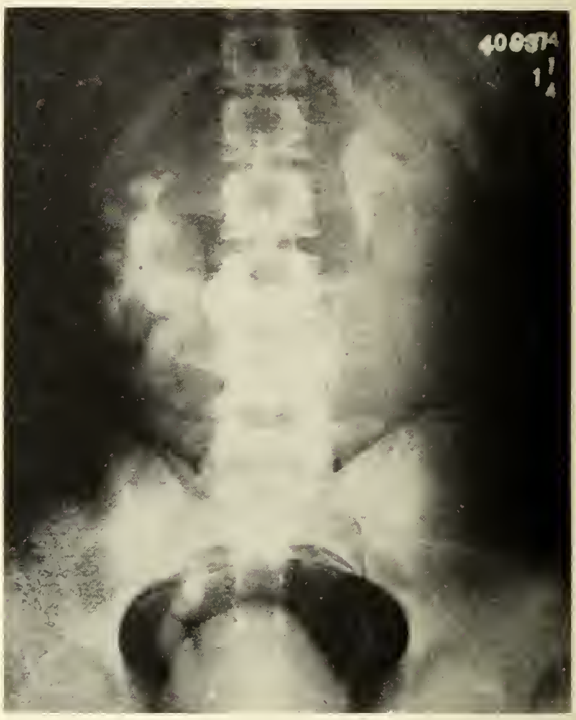


Fig. 2. Intravenous urogram, showing right hydronephrosis and hydro-ureter, with obstruction at the intramural portion of the ureter.

LITHIASIS

It is well known that shadows frequently appear in roentgenograms of the urinary tract which are difficult to identify without cystoscopic data, and as a result the diagnosis may remain doubtful. Surgeons have often explored the kidney or ureter for stone unsuccessfully, with no more exact evidence than was afforded by the roentgenogram. With intravenous urography such shadows can usually be identified and localized by the general profession (Fig. 4). Not alone will the urogram determine whether shadows are in the kidney or ureter, but it will determine their exact location. In the majority of cases the shadow of the stone is visible in the outline of the involved pelvis or ureter more distinctly than in the retrograde urogram. The method will also permit recognition of the comparative renal function of both kidneys and demonstrate any coincident disease or anomaly which may exist in either kidney. If small renal stones are present, the lack of detail in the outline of the calix or pelvis may not permit identification or localization. The method is of value in visualizing the best method of surgical approach to stones situated in the ends of the calices as well as any deformity or dilatation of the calix affected. Localization of a stone in the ureter also may be accomplished more accurately and with much less inconvenience to the patient. It obviates the danger of serious secondary infection which occasionally occurs in the presence of an occluding stone in the ureter. As a rule, evidence of stasis will be present in the ureter, accompanied by a variable degree of ureterectasis. This may be either general or localized to the portion of the ureter adjacent to the stone. If it is not possible to visualize the ureter because of diminished renal function or for technical reasons, it will be necessary to employ retrograde urography.

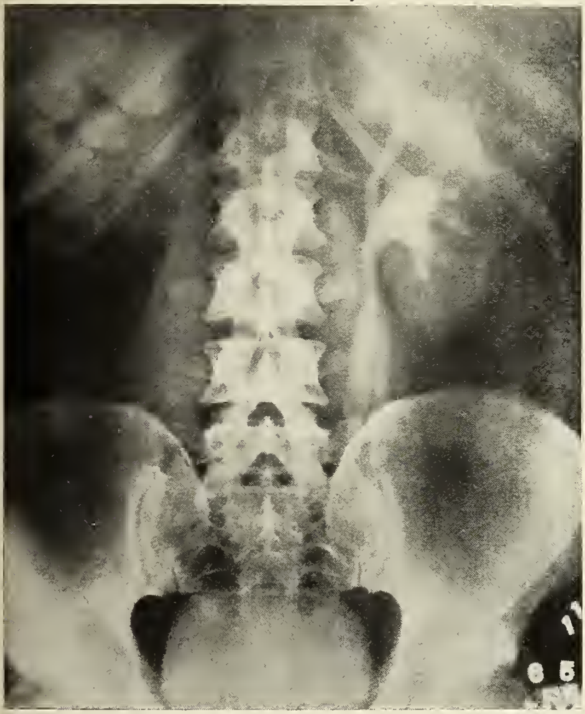


Fig. 3. Intravenous urogram, showing huge hydronephrosis and hydro-ureter on right side with complete duplication of renal pelvis and ureter on the left.

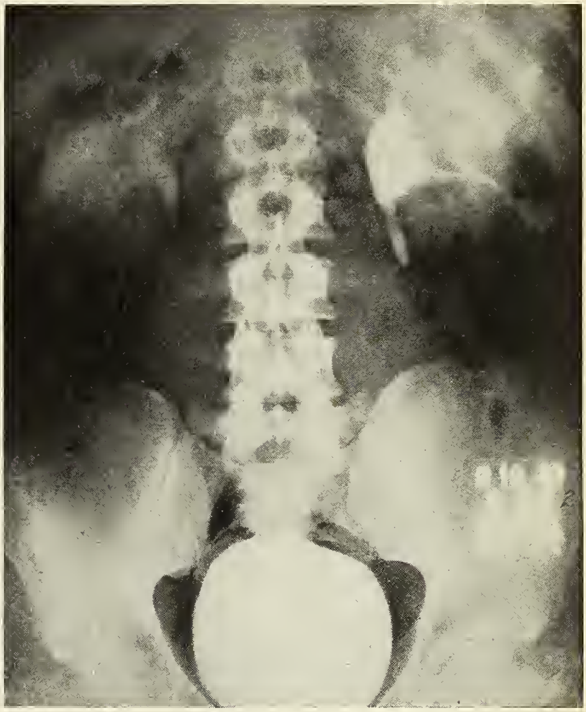


Fig. 4. Intravenous urogram, showing stone in left upper ureter causing obstruction; a shadow is visible in the upper part of the ureter.

RENAL TUBERCULOSIS

The lack of detail observed with intravenous urography frequently renders the method of doubtful value in the diagnosis of renal tuberculosis, renal tumor, and polycystic kidney, particularly in the early stages. The recognition of early renal tuberculosis often depends on the recognition of deformity in the minor calices so that their clear visualization is necessary. In order to accomplish this, retrograde urography is usually preferable. When ureteral catheterization is impossible or contra-indicated, the difference in visualization of the two kidneys may be of value in the recognition of tuberculosis. If, for instance, the bacillus of tuberculosis is found in the urine and a normal kidney is visualized on one side, evidence of delayed or diminished visualization on the other side, even though not clear, would indicate disease. With stasis resulting from stricture the deformity with tuberculosis is occasionally clearly visualized. However, it is usually inadvisable to depend on the intravenous urogram alone in the surgical treatment of renal tuberculosis, since catheterization of one or both ureters is usually necessary to determine if one kidney is normal. When one kidney has been catheterized and found to be normal, and it is impossible to catheterize the other, intravenous urography may be of great value.

RENAL TUMOR

Renal tumor in its early stages, or when situated so as to cause little deformity in the calices or pelvis, may also be difficult to recognize in the intravenous urogram (Fig. 5). The more advanced the lesion and the greater the pelvic deformity the more readily will it be recognized. Failure of visualization of the renal pelvis, or the outline of scattered calices in contrast to a normal pelvis and calices on the other side, may be of value in the identification of abdominal tumor. The detailed outline of the deformed, elongated calices regarded as typical of renal neoplasm will seldom be clearly visualized and the retrograde urogram will often be necessary.

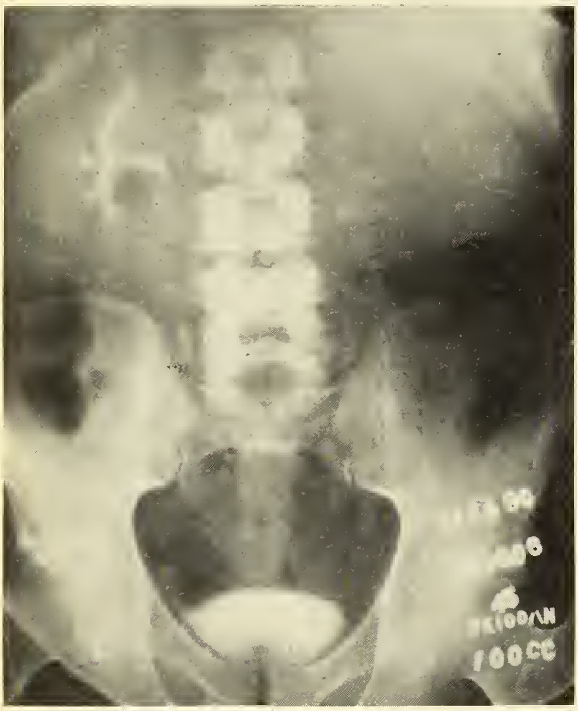


Fig. 5. Intravenous urogram. showing fragmentary calices dimly visible in a case of large left abdominal tumor. A diagnosis was made of left renal tumor; the right kidney was normal.

Polycystic kidney can be easily overlooked in the intravenous urogram. It is well known that excretion of dye is delayed and diminished with polycystic disease. As a result visualization of the renal pelvis and its details may be quite inadequate and may be accomplished only in films made a long time after intravenous injection. In the presence of stasis, however, the films may reveal an outline which is readily recognizable. It should be remembered that secondary stasis occurring with either of these conditions may be confused with the primary etiologic lesion.

RENAL PTOSIS

Intravenous urography should be of general diagnostic value in cases of renal ptosis. The degree of renal excursion can be determined by urograms made in both the dorsal and erect position. Of greater importance is the recognition of stasis in either renal pelvis or ureter, since this is the most significant factor in determining the advisability of nephropexy.

ANOMALY

The possible existence of anomaly of the kidney and ureter is usually overlooked in abdominal diagnosis, as well as in the course of cystoscopic examination, or even retrograde urography. Intravenous urography will undoubtedly determine the existence of anomaly involving the upper part of the urinary tract much more frequently than was possible formerly, and in many cases when clinical data would not indicate it. Duplication of the renal pelvis may easily be overlooked in the retrograde urogram if only one of the pelves is outlined and resembles a normal pelvis. Renal fusion and ectopic kidney are easily overlooked if the pelvis appears to be in a normal position. Intravenous urography visualizes both pelves, and their relation in position and outline and will usually determine the type of anomaly present.

LESIONS IN THE LOWER PART OF THE URINARY TRACT

The relation of the ureter and the kidney to lesions in the bladder and prostatic urethra can best be ascertained by intravenous urography. In fact, in the presence of a large tumor of the bladder involving the ureteral orifice, or of extensive prostatic obstruction, it is frequently impossible to determine the condition of the ureters and kidneys by means of cystoscopic examination and ureteral catheterization. If on cystoscopic examination the tumor in the bladder is found to involve the ureteral orifice, it is usually impossible to catheterize the ureter and it may be difficult to determine its condition and the function of the kidney on that side. With intravenous urography the dilatation in ureter and pelvis, as well as visualization of renal function on the affected side, is made possible. This is of great advantage to the surgeon, particularly with a view to the possibility of transplanting the ureter or the necessity of performing nephrectomy. Incidentally, the cystogram resulting from intravenous urography may also show the deformity of the bladder caused either by a filling defect from a protruding tumor or pathologic change subsequent to prostatic obstruction. In fact, with every case of vesical neoplasm, an intravenous urogram should be made as a routine. Similarly, with prostatic obstruction visualization of ureterectasis or pyelectasis which might exist without any clinical symptoms to suggest it would manifestly be of considerable value. In the course of intravenous urography many unsuspected complications are frequently visualized, such as hydronephrosis, anomaly, or absence of one kidney.

It is evident, therefore, that, with the recent introduction of intravenous urography, medicine and surgery have been given a noteworthy addition to the methods of diagnosis. The medical profession has not yet awakened to the full realization of its adaptability or its general diagnostic value. In the course of time the ability to interpret the intravenous urogram will become more general. At present, however, it is still limited largely to the recognition of stasis and the identification of lithiasis; the necessity of correlation with other urologic data remains.

BIBLIOGRAPHY

1. Binz, A., and Räth, C.: Über biochemische Eigenschaften von Derivaten des Pyridins und Chinolins. Biochem. Ztschr., 203:218-222, 1928.
2. Bronner, H.: Aussprache über Pyelographie. Fortschr. a. d. Geb. d. Röntgenstrahlen, Kongressheft, 42:20-21 (Aug.), 1930.
3. von Lichtenberg, A., and Swick, M.: Klinische Prüfung des Uroselectans. Klin. Wchnschr., 8:2089-2091, 1929.
4. Osborne, E. D., Sutherland, C. G., Scholl, A. J., and Rowntree, L. G.: Roentgenography of urinary tract during the excretion of sodium iodid. Jour. Am. Med. Assn., 80:368-373 (Feb. 10), 1923.
5. Roseno, A.: Studien zur intravenösem Pyelographie. Verhandl. d. deutsch. Gesellsch. f. Chir., 8:431-433, 1928.
6. Roseno, A.: Die intravenöse Pyelographie. Arch. f. klin. Chir., 157:64-66, 1929.
7. Swick, M.: Darstellung der Niere und Harnwege im Röntgenbild durch intravenöse Einbringung eines neuen Kontraststoffes des Uroselectans. Klin. Wchnschr., 8:2078-2089, 1929.
8. Swick, M.: Intravenous urography by means of uroselectan. Am. Jour. Surg., 8:405-414 (Feb.), 1930.

THE VALUE OF THE ROENTGENOLOGIC EXAMINATION OF THE CHEST*

Walter H. Ude, M.D.
Minneapolis

MEDICAL opinion has passed through many changes during the past year with regard to the place of roentgenology in the diagnosis of diseases of the chest. Viewed comparatively recently with open hostility by our most expert physical diagnosticians, it is now accepted more and more as the most valuable method of study at our disposal. Instead of having his field referred to as "bastard pathology" (Sir Thomas Horder), the roentgenologist is now being accepted as an expert consultant whose opinion must be given all due consideration, even if it brings out factors entirely at variance with physical findings. The clinician of today is the close friend of the roentgenologist, and the feeling existing between them is one of mutual admiration for each other's work. Where they thus work harmoniously, the clinician admitting his lack of expert training in roentgenology, and the roentgenologist qualifying his conclusions by possible errors in technic as well as by his not possessing the very important factors of the history and clinical course, these two will be of the utmost help to each other in the attempt to reach a diagnosis.

In discussing the value of the roentgenologic examination of the chest, one should exclude all studies based on roentgenograms which are lacking in technical quality, or which are interpreted by one with insufficient experience. The rapid development in this field of diagnosis has given us all the factors necessary to produce films of the best quality. Our medical schools, both under-graduate and post-graduate, are furnishing more and more well trained roentgenologists. Thus the adverse factors which tend to discredit the roentgenologic examination may be readily avoided. When they are not avoided they should not be used as an accusation against this entire diagnostic field.

The roentgenologic study of the chest may be considerably influenced by the condition of the patient. Numerous circumstances may make it imperative not to remove the patient from his bed, allowing a bedside film only. With improved equipment and our newer methods of technic, this type of study is very satisfactory. Consolidation, atelectasis, pleural effusion, and other gross pulmonary pathology may be thus studied with a high degree of accuracy without annoyance or danger to the patient. However, for the most accurate study of the chest the patient should be able to coöperate sufficiently well so that stereoscopic films may be made with him in the erect position. For the careful study of minimal changes in the lung parenchyma, stereoscopic films are essential. Occasionally, men with wide diagnostic experience discount the value of the stereoscope. However, they recognize the value of having two films made at different positions of the tube, allowing the demonstration of infiltrations on one film which on the other may be overshadowed by the bony structures of the thorax. I venture to state that in a difficult case no roentgenologist will dispense with the aid of stereoscopic films, and in most instances will welcome the aid of the stereoscope. From the usual postero-anterior films of the chest it may be determined whether films in other directions or whether fluoroscopic examinations should be made to aid in arriving at a satisfactory conclusion. Lateral films of the chest are proving of invaluable help in many pathological conditions, and these films may be made at the bedside almost as readily as in the X-ray department.

Fluoroscopy may be of considerable aid in the diagnosis of diseases of the chest, although such observations are often misleading. It should never be relied on for the demonstration of early tuberculosis or other minimal pathologic changes. It may often aid in differentiating a pathologic process which has been demonstrated on the film. Many clinicians include fluoroscopy of the chest as one of the routine procedures in the course of a physical examination. In one of our well known sanatoriums, all patients are fluoroscoped on their first day in the hospital, and the findings are given to the clinician before he sees the patient.

---

*From the Departments of Roentgenology of the Minneapolis General Hospital and the University of Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

The various pathologic conditions which are commonly found in the chest may be readily grouped according to the degree of accuracy with which they may be demonstrated roentgenologically. This discussion will not include diseases of the heart or pericardium. In the following classification the relative degree of accuracy with which the condition is demonstrated is indicated by its position in the group into which it is placed:

A. Diseases of the chest demonstrated roentgenologically with high degree of accuracy:

Diseases of the Lungs

1. Tuberculosis.
2. Lobar pneumonia.
3. Metastatic malignancy.
4. Massive atelectasis.
5. Pulmonary abscess.
6. Bronchiectasis, if studied with iodized oils.
7. Purulent bronchiolitis.
8. Bronchopneumonia.
9. Non-opaque foreign bodies in the bronchi.

Diseases of the Mediastinum

1. Thymic enlargement.
2. Aneurism of the aorta.
3. Substernal thyroid.
4. Calcification of tuberculous lymph nodes.

Diseases of the Pleura

1. Pneumothorax.
2. Pleural effusions:
   - Free
   - Encapsulated
   - Interlobar
   - Mediastinal
   - Hemorrhagic
3. Hydro-pneumothorax.
4. Diaphragmatic adhesions.
5. Calcified pleura.

B. Diseases of the chest demonstrated roentgenologically with moderate degree of accuracy:

Diseases of the Lungs

1. Chronic lung fibrosis.
2. Pulmonary infarction.
3. Pulmonary congestion.
4. Chronic bronchitis.
5. Bronchiectasis, without the use of iodized oils.
6. Emphysema.
7. Pneumoconiosis.
8. Primary malignancy.

Diseases of the Mediastinum

1. Lymphogranulomata:
   - Hodgkin's disease
   - Leukemia
   - Lymphosarcoma.
2. Non-calcified tuberculous lymph nodes.
3. Metastatic malignancy.
4. Mediastinal abscess.
5. Paravertebral abscess.

Diseases of the Pleura

1. Endothelioma.
2. Metastatic malignancy.
3. Thickened pleura.

C. Diseases of the chest demonstrated roentgenologically with difficulty:

Diseases of the Lungs

1. Mycotic infections.
2. Syphilis.
3. Acute bronchitis.

Diseases of the Mediastinum

1. Chronic mediastinitis.

Diseases of the Pleura

1. Pleurisy, acute, without effusion.

Because of its prevalence, tuberculosis of the lungs has been studied most extensively and thoroughly. Its characteristic appearance in the roentgenogram allows detection of the process in its very early stage, often long before any abnormal physical findings become evident. It is therefore clear that a film of the chest is essential whenever this condition is suspected. An adequate X-ray study of the chest which fails to show tuberculosis will rarely mislead the clinician, and is the best available evidence of the absence of this disease. Often extensive tuberculous infiltrations are demonstrated roentgenologically which were entirely unsuspected from the clinical examination. Cavities are readily demonstrated. Knowledge of the extent of the disease is also of importance in connection with the newer forms of surgical therapy. Finally, progress of the disease may best be observed by periodic X-ray examinations.

Although lobar pneumonia may be readily diagnosed clinically, it is often impossible for the clinician to determine its extent or its location. Here the roentgenograms, representing bedside antero-posterior and lateral films, may be of great help, and rarely fail to demonstrate even the very earliest stages of the disease. In this way we have recently been able to show that lobar pneumonia always begins as a triangular consolidation the base of which is at the periphery, and that so-called hilum or central pneumonia is a misnomer and never occurs. We frequently find the earliest area of consolidation in the retro-cardiac region, so that the antero-posterior film alone may not reveal its presence unless one is exceptionally trained to evaluate slight changes in density within the cardiac shadow itself. In these cases the lateral film is very helpful, and often definitely diagnostic.

The use of iodized oil in the study of the chest has greatly increased our ability to demonstrate the presence of bronchiectasis. Without this aid the roentgenologic diagnosis of this condition is often impossible or may be only suspected. Purulent bronchiolitis is clinically readily confused with bronchiectasis. Roentgenologically it has a fairly characteristic appearance, although it may be confused with disseminated tuberculosis. Re-examination to observe progress will confirm the diagnosis.

Bronchopneumonia is most frequently found in the aged and in the debilitated, and usually has a very characteristic appearance. In the past the early consolidations of lobar (alveolar) pneumonia have frequently been interpreted as bronchopneumonia, necessitating later apologies when the consolidation assumed a lobar distribution. Atypical pneumonias such as accompany influenza may be difficult to classify. I consider these to be of the alveolar type in many instances, but this undoubtedly varies greatly with the type and virulence of the infection.

The above classification emphasizes the interesting fact that acute bronchitis is not readily diagnosed roentgenologically. Most of these cases show no demonstrable changes in the lung. Occasionally a soft diffuse increase in the broncho-vascular tree may be present with this condition. This must not be confused with the prominence of the vascular tree found on films made with a comparatively long time of exposure. Stasis in the pulmonary circulation secondary to cardiac disease may also be very confusing, but can be differentiated by the study of the heart itself.

It is not within the scope of this paper to discuss all of the problems associated with the roentgenologic differentiation of the diseases which have been included in the above classification. Many of these do not show characteristic changes in the roentgenogram, and the findings are frequently merely "suggestive." This may apply to any of the conditions which have been enumerated. Further studies, periodic re-examinations, and prolonged observation may be necessary to reach a satisfactory conclusion. In these cases the friendly coöperation between clinician and roentgenologist is absolutely essential.

SUMMARY

1. Roentgenologic diagnosis in diseases of the chest has reached a high degree of accuracy, especially if it is aided by the friendly coöperation of the clinician.

2. Technical factors and a thorough knowledge of the applicability of the various methods of study are of great importance. Fluoroscopy and bedside films may be adequate to rule out the presence of gross pathology, but should not always be relied upon for absolute diagnosis.

3. There is a considerable variation in the degree of accuracy with which the various diseases of the chest may be diagnosed roentgenologically. This is emphasized by a classification of these diseases.

4. A single roentgenologic examination may often be inconclusive. Periodic re-examinations guided by clinical observation may be necessary to reach a satisfactory conclusion.

802 MEDICAL ARTS BUILDING.

THE VALUE OF ROENTGENOLOGIC EXAMINATION OF THE STOMACH AND GALLBLADDER*

Harry M. Weber, M.D.
Rochester, Minnesota

In the three decades which have elapsed since the discovery of roentgen rays, application of roentgenologic methods to study of pathologic changes of the alimentary tract in the living subject has resulted in development of a diagnostic procedure which possesses unprecedented precision and reliability. The roentgenologic method has a fundamental and rational appeal. The information it supplies is largely visual, and hence objective. Herein lies its basic value, and the foundation for the great interest, even enthusiasm, with which roentgenologic procedures are generally received.

Observations made at laparotomy or necropsy may be at variance with roentgenologic data. However, the roentgenologist does not think that this constitutes evidence that the method is limited in its value. He considers, rather, that the observer has not fully appreciated the evidence which the method is capable of yielding. Correlation of data obtained by necropsy and laparotomy, with skillfully elicited roentgenologic findings, discloses not only that this attitude of confidence on the part of the roentgenologist is not unwarranted, but also serves to explain, at least in part, the accruing reliance which others place on the method.

A tendency may have been fostered in some quarters, however, to permit roentgenologic investigation to supplant the carefully elaborated clinical survey of the patient. Obviously such a tendency is to be discouraged. Those who appreciate the efficiency of the roentgenologic method, as well as its limitations, do not fail to evaluate its usefulness in terms of the patient. Little doubt can be entertained that the application of the roentgen rays to the study of disease of the upper part of the alimentary tract has contributed greatly to precision in gastro-enterologic diagnosis, but it is questionable whether or not the physician's burden has been substantially lightened by it. To him falls the lion's share of the responsibility of passing judgment on the results of examination and of determining the procedure which is indicated in investigating the individual case.

Inquiry into the actual value of the roentgenologic method in the diagnosis of disease of the stomach and gallbladder is attended with not a little difficulty. Of necessity, one must consider how valuable it can be made rather than how valuable it actually is in a given set of circumstances. Obviously its utility and significance will be increased proportionately with the roentgenologic experience and skill of the observer, and with the regard for meticulous detail with which the data are elicited and interpreted. The method is all too frequently branded as inefficient only because the physician failed to avail himself of the full benefits which could have been reaped by proper utilization of the procedure. Neglect of such details as careful roentgenoscopic and roentgenographic technic, adequate preparation of the patient, and proper administration of contrast material, accounts for much of the unsound roentgenologic opinion which is promulgated.

Moynihan is quoted by Barclay as having made the statement that roentgenologic examination of the stomach is of more value than all other methods put together. At the present time, the method is so universally utilized that one might prefer to devote time to consideration of its limitations, but I shall endeavor to review, in a general way, some of the specific data which I feel the roentgenologic method can be made capable of providing.

Roentgenologic examination of the stomach and duodenum does not, in any sense, consist in exhibition of a technically good roentgenogram of these organs filled with opaque material. By chance, such a roentgenogram can be diagnostic if the pathologic process is extensive, or if a relatively limited involvement happens to have been projected in precisely the most advantageous manner. An apparently normal roentgenogram is, however, never adequate to exclude the presence of disease. In recommending fluoroscopic examination of the stomach as the indispensable roentgenologic procedure, I am far from desiring to pass as inadequate or impractical the plan of "serial roentgenography" of Cole, and those of his followers who adhere closely to his teachings. I also recognize the excellence and diagnostic precision which the methods of Forssell, Rendich, and Berg are capable of yielding. The fluoroscopic examination, however, carefully and properly performed, can be made to produce a diagnostic efficiency pratically equal to all of these methods, and has the additional advantages of convenience, rapidity, and relative inexpensiveness. The trained gastro-enterologic roentgenoscopist is confident that fluoroscopic investigation permits him to make adequate observations of the external contours of the stomach and duodenum; it allows him to rotate his patient in whatever position is necessary to demonstrate these contours, and by manipulation and compression of the gastric and duodenal walls he secures the essential details of the inner contours of these organs which he admits the methods of Berg and Forssell might demonstrate more clearly and graphically. Obviously the ideal roentgenologic investigation will include any or all procedures which will serve best to facilitate a clear-cut and complete diagnosis. Those who favor the roentgenoscopic method do not fail to appreciate the complementary and corroborative advantages of roentgenography, and do not hesitate to utilize it whenever expedient.

---

*From the Section on Roentgenology, The Mayo Clinic, Rochester, Minn. Read before the Minnesota State Medical Association, Minneapolis, May 5, 1931.

W. J. Mayo once made the statement that only about one patient in ten with gastric symptoms has a gastric lesion. If this is true, the first and most obvious value of roentgenologic examination will consist in the proficiency which it allows of selecting the one patient with stomach trouble on a basis of organic disease, from the overwhelmingly larger group whose complaints are of a functional nature, or whose symptoms are referred to the upper part of the alimentary tract from an organic lesion situated elsewhere in the abdomen. The question uppermost, then, in the physician's mind, when he has decided to submit his patient for roentgenologic examination, is, "Is or is not a gastric or duodenal lesion present?" The roentgenologic method can be made to furnish an explicit affirmation or negation in reply. Study of large numbers of patients who had been subjected to roentgenologic examination of the stomach and duodenum previous to exploration reveals that the roentgenologic efficiency in correctly determining the presence or absence of organic gastric or duodenal disease runs consistently higher than 90 per cent. In other words, not more than 5 to 10 per cent of organic lesions of the stomach and duodenum escape detection by a properly executed roentgenologic examination, and in the absence of roentgenologic signs of disease a gross anatomic lesion can be definitely excluded from the clinical picture.

The roentgenologic method can and does extend its value beyond this point. For the institution of an intelligent therapeutic program a knowledge of the nature of the disease is essential. Is the lesion malignant or benign?

CARCINOMA OF THE STOMACH

The incidence of malignant disease in the duodenum is known to be low, but approximately a third of all carcinomas occur in the stomach, a figure which emphasizes the value of a procedure which will enable the diagnosis to be made as early as possible. In this respect, roentgenologic examination takes precedence over all other methods of investigation. Not only are roentgenologic signs of malignant disease clear-cut and pathognomonic in all those cases in which these conditions are detectable by other methods, but it is capable of revealing lesions which are as yet impalpable, and in which chemical and microscopic examinations of gastric content are not determinative. It is not an altogether uncommon occurrence for roentgen rays to uncover the presence of a gastric carcinoma which gave no other sign of its presence. On the other hand, negative roentgenologic exploration of the stomach for carcinoma almost precludes its presence, since, according to Carman, 95 per cent of carcinomas of the stomach at The Mayo Clinic were roentgenologically demonstrable. In the presence of a palpable tumor of questionable origin, roentgenologic examination distinguishes between intrinsic and extrinsic gastric tumors with greatest accuracy. Further, it has a most decided advantage over all other means of investigation in the clarity and precision with which it establishes the site, extent, and general anatomic characteristics of the process. Such information is of particular value in answer to the surgeon's question concerning operability, and the particular surgical procedure he might see fit to initiate.

BENIGN LESIONS OF THE STOMACH

Although benign neoplasms of the stomach are rarely encountered, the roentgenologist is prepared to recognize them as such when they are present. He is disposed to designate such a lesion as a "polypoid tumor" because he is aware that a considerable variety of histologic types of lesions produce identical roentgenologic appearance. It is also known that especially one histologic type of polypoid tumor, the adenoma, although grossly benign in character, may exhibit microscopic evidence of malignancy. Many of these lesions are entirely unsuspected clinically, but some of them have been shown to be responsible for repeated obscure hemorrhages to which varying grades of secondary anemia are traceable. Adenoma may be single or multiple; the other histologic varieties are usually solitary lesions. Very small polypi are exceedingly difficult to recognize, but those which have attained the size of 2 cm. or more will scarcely ever escape roentgenologic detection.

By far the most commonly encountered benign gastric lesion is the gastric ulcer. Consummate roentgenologic skill is at times required to demonstrate very minute ulcers and those situated high in the cardiac portion of the stomach, yet the diagnosis of gastric ulcer is practically identical in accuracy with the diagnosis of other gastric lesions. Nowadays the roentgenologic diagnosis of ulcer of the stomach is based almost exclusively on the direct evidence of the lesion. The demonstration of the pathognomonic sign of the crater of the ulcer, or the niche, must be elicited, and in the absence of this evidence the roentgenologist hesitates to offer the diagnosis even in the presence of very suggestive indirect signs, such as the incisura, the hourglass deformity, and the diffuse gastric spasm.

Carcinomas of the stomach may become ulcerated, but in dealing with such a lesion it is unusual for the roentgenologic signs of malignancy to be so indefinite or obscure that its carcinomatous nature is not discerned. In other words, there is a definite roentgenologic syndrome with which carcinoma is identified, and a distinctive set of signs which denotes benign ulcer. It must be remembered, however, that certain ulcers of the stomach, which on roentgenologic examination and gross inspection had all the features which we have learned to associate with a nonmalignant process, have been shown on microscopic examination to have malignant cells in their edges, and the subsequent condition of the patient bore out the validity of the microscopic disclosures. In those cases, the roentgenologist can hardly be expected to do more than allow his case to rest when he has offered his evidence of the presence of the lesion. Carman taught that gastric ulcers 3 cm. or more in diameter are likely to be carcinomatous, but ulcers much smaller than this have shown microscopic evidence of malignancy.

The gastric ulcer which occurs in the pyloric third of the stomach merits special consideration. In this situation, any ulcerative process, whether malignant or benign, may produce an obstructing deformity by a combination of spastic and organic changes, which makes roentgenologic determination of the precise nature of the lesion extremely difficult at times. Administration of an antispasmodic sometimes reduces the spastic component to a minimum, and thus lends valuable aid in bringing out the direct anatomic evidence more clearly. Frequently, however, the roentgenologic evidence admits of no more refinement than the report of an obstructing lesion at the gastric outlet. Exploration reveals that this roentgenologic picture may be the result of genuine malignant infiltration, single or multiple benign gastric ulcer, or obstructing duodenal ulcer with associated pyloric spasm.

DUODENAL ULCER

Examination of the duodenum is always included in the complete roentgenologic investigation of the stomach. Tumors of the duodenum are exceedingly rare, but the duodenal ulcer is an anatomic and pathologic entity of great practical importance. Fortunately the roentgenologic method is particularly efficient in demonstrating this lesion. The signs are so constant and reliable that it can safely be said that not more than 5 per cent of duodenal ulcers will escape expert roentgenologic investigation, and, on the other hand, negative results of roentgenologic investigation of the duodenum almost preclude the presence of duodenal disease. It seems necessary, however, to point out that although the characteristic bulbar deformity or the pathognomonic duodenal niche may be obvious even to the inexperienced observer of roentgenologic shadows, the realization of full roentgenologic efficiency is likely to come only to the examiner who is particularly alert, attentive, and expert.

RARER GASTRIC LESIONS

Less frequently encountered diseases of the stomach are syphilis, tuberculosis, and actinomycosis. Gastric syphilis, however, occurs often enough to merit habitual consideration in gastric diagnosis. The roentgenologic syndrome is sufficiently distinctive to make rendition of the diagnosis possible in a high percentage of cases, but even if the roentgenologic evidence is not clear-cut and pathognomonic in every case, yet the presence of a gastric pathologic condition always will be indicated, and the roentgenologic examination may be said to serve a valuable directive and corroborative purpose. Tuberculosis and actinomycosis of the stomach are so rare that they have little practical diagnostic importance.

THE STOMACH AFTER OPERATION

Roentgenologic examination is often utilized to determine the functional behavior of the stomach after one of the various operations used in treatment of gastric lesions, and to aid in finding the cause of occasional unsatisfactory results. The commonest type of lesion one expects to find is the gastrojejunal ulcer after gastro-enterostomy, and local recurrence after resection for malignant growths. The roentgenologic diagnostic problem is made complex because of the physical and functional changes produced by the surgical intervention, and the method is not expected to maintain the precision it has in detection of the primary lesion. As roentgenologic experience accumulates, however, constant improvement in accuracy is noted, and with close coöperation of clinician and roentgenologist, the correct diagnosis is reached in all but a small percentage of cases.

THE GALLBLADDER

Abel and Rowntree, in 1909, showed that phenoltetrachlorphthalein is eliminated from the body chiefly in the bile. Fifteen years later, Graham and Cole applied this knowledge to introduce one of the most remarkable advances in diagnostic medicine, namely, cholecystography. By substituting, in the phenoltetrachlorphthalein molecule, the elements bromine or iodine for the far less radiable chlorine, they came into possession of a dye which makes the ability of the gallbladder to receive and concentrate the dye-laden bile subject to roentgenologic scrutiny. Essentially, then, cholecystography is a qualitative test of the functional capacity of the biliary tract. It is not primarily a method of directly demonstrating pathologic change.

Gallstones, when they contain sufficient calcium, can give primary evidence of their presence on the roentgenogram. The gallbladder, too, when its walls are very markedly thickened or calcified, or when it is enormously distended with bile or fluid, can cast a primary shadow. Most gallstones, however, do not contain sufficient calcium to cast shadows and the percentage of definitely diseased gallbladders which can be demonstrated roentgenologically, without the use of the contrast dye, is so low that prior to cholecystography the roentgenologic diagnosis of cholecystic disease was generally held in rather low regard.

The Graham-Cole method was received with general enthusiasm, and it was soon learned that the extraordinary value of the procedure consisted in the exhibition of failure in function of the gallbladder. After the method had been in use for a time, it was determined that the gallbladder which was found to be pathologic, by the surgeon's gross examination, and by the pathologist's microscopic investigation, was unable to receive and to concentrate a sufficient quantity of the dye-laden bile to make itself roentgenologically apparent. At the present time, Kirklin, whose statistical studies are similar to those of other observers, finds that demonstration of the so-called nonfunctioning gallbladder means cholecystic disease in more than 96 per cent of the cases which he has been able to follow to exploration. It is important to note, in this connection, that in making this study, gallbladders in which there was minimal microscopic evidence of disease were not included as pathologic.

A normal cholecystogram, however, does not imply a normal gallbladder. This fact becomes obvious when one considers the great number of normally functioning gallbladders within the shadows of which gallstones are visualized. Moreover, Kirklin, Caylor, and Bollman demonstrated that a definitely diseased gallbladder does not invariably lose its capacity of concentrating the dye, and that there is no constant relationship between the degree of concentration of bile and that of the cholecystographic medium. Kirklin has repeatedly pointed out that the greatest number of diagnostic errors occurs in the group of cases in which a normal cholecystographic response was elicited, but in which cholecystic disease was found at operation.

Perhaps the most valuable aspect of the normal cholecystographic response is the facility with which it reveals the presence of gallstones. Depending on their calcium content, stones produce areas either of increased or diminished density in the shadow of the gallbladder, and are usually quite obvious. Occasionally, however, the evidence of cholelithiasis is so slight that it can be discerned only by most careful scrutiny.

It has become obvious to me that cholecystography, perhaps more than any other roentgenologic procedure, is out of place in the hands of those who are either unwilling or unable to devote most scrupulous attention to technical detail. This care begins with the administration of the cholecystographic medium, continues with the direction of the patient throughout the time required for carrying out the test, implies individualization of each patient, and ends only when the observer has satisfied himself that the test has been extended to its full capacity.

When consideration is taken of the rather wide gaps in basic knowledge concerning the functional and anatomic changes of the gallbladder in disease, it is a matter of wonder not so much that the procedure is sometimes in error, as that it is so rarely wrong. In evaluating cholecystography, the high efficiency of the clinical diagnosis of cholecystic disease must be kept in mind. In the frank case, cholecystography is corroborative; in the more obscure case it is directive, occasionally perhaps determinative. At all events, it is a laboratory procedure, and as such should not be relied on without other data to affirm or deny the presence of cholecystic disease. Rather let the family physician or the clinician collaborate with the roentgenologist, collect all available information, and estimate the probabilities of disease and its gravity.

BIBLIOGRAPHY

1. Abel, J. J., and Rowntree, L. G.: On the pharmacological action of some phthaleins and their derivatives, with especial reference to their behavior as purgatives. I. Jour. Pharmacol. and Exper. Therap., 1:231-264 (Aug.), 1909.
2. Barclay, A. E.: The dangers of specialization in medicine. Brit. Jour. Radiol., 4:60-82 (Feb.), 1931.
3. Berg, H. H.: Röntgenuntersuchungen am Innenrelief des Verdauungskanals. Leipzig, Georg Thieme, 1930, 199 pp.
4. Carman, R. D.: The roentgen diagnosis of diseases of the alimentary canal. Philadelphia, W. B. Saunders Company, 1920, 676 pp.
5. Forssell, Gösta: Normale und pathologische Reliefbilder der Schleimhaut. Ein Überlick über die Autoplastik des Digestionskanales. Verhandl. d. Gesellsch. Verdauungs- u. Stoffwechselkr., 7:199-219 (Oct.), 1927.
6. Graham, E. A., and Cole, W. H.: Roentgenologic examination of the gallbladder, preliminary report of a new method utilizing the injection of tetrabromphenolphthalein. Jour. Am. Med. Assn. 82:613, 614 (Feb. 23), 1924.
7. Kirklin, B. R.: Necessity for accurate technic in oral cholecystography; errors attributable to technical lapses. Am. Jour. Roentgenol. and Radium Therap. 25:595-601 (May), 1931.
8. Kirklin, B. R., Caylor, H. D., and Bollman, J. L.: The concentration of cholecystographic mediums and bilirubin by the gall bladder. Radiology. 9:463-469 (Dec.), 1927.
9. Kirklin, B. R.: The normal cholecystographic response. Radiology. 11:34-36 (July), 1928.
10. Rendich, R. A.: The roentgenographic study of the mucosa in normal and pathological states. Am. Jour. Roentgenol. and Radium Therap., 10:526-537 (July), 1923.

THE INDICATIONS FOR AN EXAMINATION OF THE COLON*

Edwin L. Gardner, M.D.
Minneapolis

The mechanism producing gastrointestinal symptomatology usually cannot be attributed to one offending organ alone. An abnormal function of the stomach, or of the liver, or any other part of the gastrointestinal tract is likely to affect the activities of the entire digestive system. This is noticeably true in disturbances of the colon. In order to simplify and coördinate our knowledge, we should be reminded of several fundamental physiological principles of colonic function.

1. The colon is embryologically, anatomically, and functionally two distinct organs. The proximal colon is a thin walled, easily dilatable organ for the absorption of fluids and their dissolved contents, as well as an organ of propulsion of liquid or semi-fluid material; while the distal colon is essentially an organ of elimination, as shown by its stronger musculature, greater tonicity, and greater capacity for vigorous mass peristalsis.

2. The colon is a non-striated muscular tube, whose activities obey the laws affecting involuntary muscle, but with certain adaptation for function. Non-striated muscle responds to tension by contraction, but in the case of the colon, adaptation has normally produced a marked refractory stage after massive peristalsis, lasting 6 to 24 hours, during which stage of fatigue the musculature is comparatively insensible to stimuli for massive contraction. It follows, then, that the normal colon does not show vigorous peristaltic waves, except when influenced by vigorous stimuli such as extend down the digestive tube after the taking of food, or especially upon arising in the morning after a good night's rest. It is this massive peristalsis which forces the stool into the lower sigmoid and rectum. The rectal tension in turn stimulates the defecation reflex. Normally, the rectum is empty, or nearly so, during the greater portion of the twenty-four hours.

3. The motor function of the colon depends upon the balance between peristalsis, on the one hand, and the resistance of muscular tonus on the other. The colon always contracts upon its content, whether it be air or fecal matter. According to the law of "postural tonus," it may contract still further, whether in a resting, contracted or dilated state. In a habitually contracted colon, such as occurs in chronic diarrhea or after the habitual use of cathartics, the stimulus produced by very slight distension may initiate active contractions, while in conditions associated with colonic dilatation only a large bowel content will stimulate motor activity. Whether the bowel is contracted or dilated, it responds to tension by contraction.

4. The digestive tube, like the heart, is autonomous; and the nervous system is essentially a regulator of muscular and secretory function. Through the influence of the nervous system, the digestive tube's irritability and threshold for receiving stimuli are greatly influenced.

5. Distress or pain from the colon is an expression of motor function, *i.e.,* tonus and peristalsis. Pressure of the palpating hand over the colon causes increased tension with resulting discomfort in sensitive cases. Stimuli may be referred to other portions of the digestive tube, either through direct extension from muscle fibre to muscle fibre, or indirectly, through the nervous system. Those symptoms arising from peritoneal irritation or from tugging on the mesentery result from an entirely different mechanism.

6. In spite of much propaganda to the contrary, the colon does not normally completely empty itself every twenty-four hours. A barium meal in the average normal is eliminated in forty-eight to seventy-two hours, and there is abundant evidence to show that the bowel, like the stomach, has a selective action on the foods which it eliminates. It has been shown that certain food residues, or small glass beads fed to healthy medical students, may not be expelled from the rectum until a period of 7-10 days has elapsed. All evidence would indicate that the average normal individual on an average diet will

---

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

have one formed stool per day, or possibly two, and that more frequent, mushy stools are the exception, rather than the rule. Normally, there is a great variation, depending upon diet and habit, and perfectly healthy individuals may, without harm, go several days with no stool. The rule often prescribed in "health literature" and broadcast to the public, that "three stools per day, one after each meal, is advisable for health" is ridiculous and likely to make semi-invalids.

What symptoms should direct our attention toward the colon? The patient may have some definite complaint beginning at some definite time, with remissions, or a definite progressive course, in which case the symptoms usually indicate some organic disease. But more often the abdominal symptoms are more or less bizarre and confusing upon first impression, and lead the examiner astray.

A careful history often gives a clue to the cause of the disturbance. The primary symptom or syndrome should always be carefully sought. In many functional colonic disturbances there is a history, dating from childhood or puberty, of either irregularities of evacuation, or, what is especially important, upper or general abdominal symptoms which are relieved or modified by evacuation of the bowels. A family history of chronic dyspepsia of a similar nature, or of migraine, is reassuring of a probable constitutional tendency to colonic disturbance.

As the years go by, the digestive tube may become more irritable and in sequence other symptoms develop, until at the time the patient appears for examination the secondary "spill-over" symptoms may off-hand resemble gallbladder, gastric, or other digestive disease. A careful analysis will again show the relation of symptoms to bowel function, and in the functional cases to fatigue and emotional states.

Pain is the most frequent symptom which causes the patient to consult the physician. The pain, caused by motor disturbances of the colon as a whole, varies from a sense of pressure to severe colic, and is frequently diffusely referred to the abdominal wall just below the navel. The pain may be related to evacuation of the bowels, and is often relieved by the passage of a good stool. It more likely occurs at those times when the colon is most active, namely, after the taking of foods, early in the morning before or upon arising, and after excitement. Localized areas of increased intracolonic tension or peristalsis may cause pain over other areas of the abdomen. A vigorously contracting cecum and ascending colon may be painful enough to cause syncope, and is likely to be associated with nausea and vomiting. In congenital hyperdescent of the colon, where the cecum lies low and is fixed in the pelvis, or when the cecum is bound down by bands or adhesions, paroxysms of pain may be unusually severe. These attacks may be confused with many abdominal lesions, but may be diagnosed by the fact that unless obstruction is present they the quickly relieved by bowel evacuation (as by a warm enema), and very often by belladonna. The giving of a large test enema may reproduce the patient's symptoms by increasing intracolonic tension.

Pain or distress arising from the sigmoidal region is likely to be referred to the rectum and lower sacral region. Pain arising about the flexures may be referred to the upper abdomen or thorax because of the close relation of the colon at these points to the innervation of the lower thoracic segments. Here again should be studied the relation of pain to colon function and its relief by the release of intracolonic tension. Only in an almost complete obstruction does the enema become ineffectual. Pain of various types may reflexly be produced in other organs, but the fact that it comes later in the history than the primary colonic complaint, or is related to colonic function, is sufficient evidence to make its source obvious.

The examination of the stools often furnishes important evidence of a colonic disturbance. Stools which are regularly normally formed, of good size, free from excess of mucus and free of blood (chemical and gross), are very good evidence that no troublesome colonic dyscrasia, either organic or functional, is likely to be present. No one single examination is as important as repeated observation of the stools to exclude colonic diseases. In the absence of bleeding hemorrhoids and fissures, or lesions of the stomach (and swallowed blood must be excluded), the constant presence of occult blood means either an ulcerated mucosa or some bleeding neoplasm. Carcinoma of the cecum may not be evident upon physical or X-ray examination and still cause extreme grades of secondary anemia. Diverticulosis is not associated with the constant presence of occult blood in the stools.

A history of progressive constipation with small pencil or ribbon-like stools indicates the necessity of a careful examination; and a chronic or recurrent diarrhea always requires further study.

An abdominal examination may disclose signs which require further elucidation. Visible peristalsis in the terminal ileum and an occasional slow contraction in the proximal colon is always suggestive of obstruction lower down. Excessive rumbling is common in fermentative dyspepsia, or in narrowing of the lumen. Abdominal distention may be due to a megacolon, gas from obstruction or fermentation, and to fluid from peritoneal exudate. A large cystic mass in the lower right abdomen which contracts under the palpating hand may occur in organic obstruction further down, and very often may be due only to a functionally spastic colon. Inflammatory masses are found in the region of the cecum and about the sigmoid, those in the latter location being most commonly due to inflamed diverticula; and these are usually hard and tender. Neoplasms may be felt anywhere along the course of the colon, but in the cecum and ascending colon may be advanced when the patient comes for examination, because of the easy distensibility of the bowel in this location, and because of the tendency to early ulceration, thereby preventing an early obstruction. In the distal colon obstruction is more likely to develop early in the disease.

Tenderness in colonic disease may be present along the course of the colon anywhere in the abdomen, which is in contrast to the symptom "pain." Frequently, it is present in the region of the cecum, but even more commonly over the descending colon in the lower left abdomen. Secondary symptoms elsewhere in the abdomen may be stimulated by pressure over a portion of the tender colon.

The term "autointoxication" is often applied to a group of general symptoms attributed to constipation and supposed to be due to absorption of some chemical poison. If this symptom-complex is always due to poisons, how can we explain their almost immediate disappearance after stool evacuation? Mechanical distension, with air or dilatable rubber bags, of the rectum or lower sigmoid may in many cases produce the signs of "autointoxication" which immediately disappear as the pressure is released. Observation, therefore, shows that tension in the bowel may produce these symptoms, and none of these hypothetical poisons have actually been demonstrated, although suspected in the occasional case. "Autointoxication" calls for a careful study of colonic motor function. Contents of the proximal colon if in a too liquid state, and if delivered to the colon by the small intestine before proper digestion has taken place, are more susceptible to bacterial action, which may result in the formation of chemical substances more readily absorbable in the excessive fluid medium. Many patients with the chronic irritable bowel, with or without spastic constipation, show excessive small intestinal hypermotility and comprise a group of cases with the autointoxication symptom-complex. No doubt, many of the symptoms in these irritable cases are a reflex expression of abnormal motor function, or increased suceptibility of an irritable nervous system to normal intestinal stimuli.

A detailed sequential history, a careful physical examination, and inspection of the stools (with a chemical test for blood), is usually enough to make a probable diagnosis, and most commonly is sufficient to exclude serious disease, but many cases require a proctoscopic and X-ray examination. An important practical suggestion is that both the proctoscopic examination and the X-ray clyster should be made without a previous cathartic or enema because of the extreme irritability and mucosal congestion which both produce for nearly twenty-four hours. This first procedure may be checked after thorough elimination, but is rarely necessary, and often the picture is confused by the preparation. In every patient a careful general examination should be made, and, when indicated, the entire gastrointestinal tract should be investigated.

SUMMARY

1. Abdominal symptoms, exaggerated or relieved by bowel evacuation, especially if increased by stimulating foods, chilling of the body or emotional strain, require a careful examination of the colon.

2. Colonic symptoms due to organic disease usually have a definite onset, accurate localization, and a progressive course. The symptoms of functional disturbances may have a life-time history; the symptoms are variable and often bizarre, usually not progressive, but exaggerated by dietary indiscretions and nervous and emotional influences. If the symptoms are due to

some general disease, their course bears a close relation to the course of the basic disease (tuberculosis, cardiorenal, anemia, etc.).

3. Unexplained blood in the stools always requires a careful examination, and unexplained anemia may be due to symptomless carcinoma, especially of the cecum.

4. A progressive constipation or diarrhea always requires a careful study of the colon and the stools.

5. Any abdominal complaint with an obscure or atypical history or unusual symptoms demands a careful colonic examination as a part of a general thorough abdominal investigation.

USE OF CINCHOPHEN AND NEOCINCHOPHEN

In consideration of reports of untoward effects, it would be well to discontinue the use of cinchophen and to substitute neocinchophen for it. Even though neocinchophen owes its activity to cinchophen, it is so slightly soluble as to be almost tasteless, devoid of irritant action on the stomach, and of remarkably low toxicity. If cinchophen is prescribed it should be under its pharmacopeial name and not as "Atophan," which is more expensive and is marketed with unwarranted claims. If neocinchophen is wanted it should be prescribed under this name and not under the uninforming designation "Tolysin." In view of the serious though rare poisoning from ordinary doses of cinchophen, the use of this drug should be restricted as much as possible to cases in which other non-narcotic analgetics, such as salicylates, acetylsalicylic acid or amidopyrine, have been tried and failed to give adequate relief, and in which the suffering is sufficiently great to justify the risk. (Jour. A. M. A., August 8, 1931, p. 409.)

THE KAADT DIABETES TREATMENT

Reports are being received that a diabetic treatment is being sent out by the Diabetic Laboratories of Fort Wayne, Indiana, the material as sent to the patient by this concern being signed by C. F. Kaadt, M.D. A quart bottle of the medicine is sold for five dollars, and the patient is asked to disregard the testing of urine for sugar. A request sent to Dr. Kaadt by the American Medical Association Bureau of Investigation, requesting that he declare the composition, did not bring this information. Instead, it appeared by the reply that while Dr. Kaadt is willing to let laymen infer that he has a cure for diabetes and sells this remedy on the mail-order plan, telling diabetics that when using it, it is unnecessary for them to use insulin or diet, he is, as yet, unwilling to give the medical profession any information on the subject. This, in spite of the fact that he admits that he has used his remedy for nine years and that he has never failed to produce a cure. (Jour. A. M. A., August 15, 1931, p. 479.)

INDICATIONS FOR SPINAL PUNCTURE*

Henry W. Woltman, M.D.
Rochester, Minnesota

THE most common purpose of spinal puncture is to obtain cerebrospinal fluid for examination. It is not indicated until the physician has some idea of what he is looking for, whether change in color, cytologic change, change in chemical composition, organisms, or hydrostatic changes. The inference is clear; examination of the fluid should be complete and a neurologic examination should precede the puncture. One should know beforehand whether or not the optic disks are choked, since presence of this phenomenon constitutes a warning that a situation exists in which puncture is not always safe.

At the head of the list of indications for spinal puncture I should place suspicion of poliomyelitis or of epidemic meningitis. In children, the ordeal will be made less trying by preliminary administration of a small dose of a sedative such as sodium *iso*-amylethyl barbiturate (sodium amytal). The seasonal incidence and the presence of epidemics aid in making a decision, and the urgency of early treatment justifies the procedure.

Symptoms suggestive of meningeal irritation, such as headache, backache, reflex spasm of the nuchal muscles on flexion of the head on the thorax, and a positive Kernig's test, whether or not accompanied by fever, in the absence of choked disks, and often an adequate period of observation, usually justify spinal puncture.

A cloudy fluid generally indicates that some organism is at work; cultures and smears should be prepared and carefully studied. Tuberculous meningitis is usually suggested by the clinical course, pleocytosis and low values for chlorides in the fluid. The diagnosis is verified by demonstration of *Mycobacterium tuberculosis* in the fluid. Actinomycotic meningitis, which is seen from time to time in rural communities, frequently displays surprisingly few signs of meningeal irritation, although the pus mixed with the spinal fluid may be so thick that suction is required to obtain it.

Suppurative otitis media is always followed apprehensively, and when signs of intracranial extension occur, puncture is usually indicated. Pus in the spinal fluid, without organisms, is not infrequently encountered; this situation is not always so grave as might be anticipated. When Queckenstedt's sign, making pressure on each side separately, is employed to assist in the diagnosis of sinus thrombosis, one must bear in mind that a response on unilateral pressure, particularly on the left side, is often absent normally, as first pointed out by Ayre.

Puncture is to be avoided, as far as possible, when one is dealing with an abscess of the brain; there is always danger of extension or rupture of the abscess. It is sometimes impossible to tell, however, whether an abscess is sufficiently mature to be operated on. Puncture may then be performed, removing as little fluid as possible. If polymorphonuclear leukocytes predominate, operation usually proves fatal, but if lymphocytes predominate, the outlook is relatively good.

Spinal puncture is usually indicated when there is evidence of progressive impairment in function of intracranial and intraspinal structures, such as one or more of the following: paralysis of cranial nerves; root pains; disturbances of pupillary, tendon and plantar reflexes; hemiplegia; aphasia; apraxia, and finally dementia, particularly in younger persons when coupled with signs which suggest organic involvement of the brain. An observation made in 1814 by Esquirel is still helpful: "In dementia a tremor of the lips is a fatal sign." Examination of the spinal fluid is most helpful in establishing the diagnosis of dementia paralytica and as a guide in the proper use of treatment by malaria. In multiple sclerosis, marked changes in the spinal fluid are usually adequate grounds for instituting active treatment, such as administration of typhoid vaccine. When mental and cerebral symptoms are accompanied by fever of obscure origin, spinal puncture usually is justified.

Comatose states occasionally present knotty problems in diagnosis. A glance at the spinal fluid may reveal the cause. The spinal fluid of patients who have syphilis should be examined within six months of the onset of the disease. A norm for these patients is thus established. Subsequent punctures should be made to determine whether the disease has invaded the nervous system, and, if it has, to determine the trend of the disease.

---

*From the Section on Neurology, The Mayo Clinic, Rochester, Minn. Read before the Minnesota State Medical Association, Minneapolis, May 5, 1931.

In transverse lesions of the spinal cord, roentgenographic study usually provides any reason there may be for not examining the spinal fluid. Complete data, particularly the character of the response on jugular compression, and estimation of the content of protein, should be made; otherwise the puncture may have to be repeated. In fracture of the spinal column if displacement is not so great that section of the cord is a foregone conclusion, demonstration of subarachnoid block is of assistance in deciding whether or not laminectomy should be considered.

Any deviation from the usual course of sciatic neuritis, particularly bilaterally, is an indication for spinal puncture. A "dry tap" in the hands of a skilled technician usually means that a tumor has filled the canal.

The last reason for diagnostic puncture I shall merely mention, namely, that of injecting air or roentgenologically opaque mediums. The selection of cases for such procedures should be left to the expert, since the procedure may be harmful, and since special experience is required both in the doing of these tests and in interpreting the results.

It need hardly be said that spinal puncture is a method by which serums, anesthetics, various dyes, and salvarsanized serums are administered. Introduction of salvarsanized serums is usually indicated in treating asymptomatic syphilis, when other methods of treatment have failed.

A useful therapeutic procedure is spinal drainage. This is usually indicated in treatment of meningitis; it provides a means of removing blood from the subarachnoid space, and may be a valuable aid in the treatment of uremic coma, malignant hypertension, status epilepticus, and delirium tremens.

I have purposely refrained from numerous temptations to go afield in the consideration of this subject. The various indications I have cited so briefly are not all of the indications, and they are subject to exceptions. To perform a spinal puncture without having preceded it by neurologic examination is a mistake. The indications will occur to every physician if he will interest himself in neurologic diseases; he can often tell what is wrong with a patient's nervous system even though he cannot attach the orthodox and unessential name to the disease.

PRESIDENT'S LETTER

A RECENT Associated Press story reports that the mails are being deluged, these days, with advertising of quacks, cultists, and medical fakes. Postal authorities are seriously taxed to trace and bar the most flagrant offenders. Physicians certainly should be interested.

No doubt this unusual activity is a sign of the times. It may be that business is not so good as it might be with this infamous gentry. On the other hand and by the same token, it may be that business is thriving. Perhaps the gullible become more gullible instead of less in times of uneasiness and want.

It is a curious quirk every physician has had to reckon with that people who complain the loudest about the legitimate bill of a regular practitioner are likely to be the first to give cash in advance to a fake.

In any case, the presence of an epidemic of so grave a disease as poliomyelitis presents a serious complication in dealing with the quack problem.

In the face of an already established paralysis the physician can offer nothing immediate or spectacular in treatment or hope of recovery. Recovery will depend upon long, tedious, disheartening regimen with no certain prospect of full recovery at the end. And a whole school of fake healers has armed itself almost over night to take advantage of the situation.

For instance, a self-styled "clinic" with headquarters in a neighboring state is very thoroughly canvassing Minnesota sufferers from the disease just now. This clinic is composed of a half dozen men, none of whom is a registered physician. They operate an "institute" with their clinic and they draw an every-growing clientele in Minnesota and the Northwest. Some live within an hour's ride of the Eustis Hospital for Crippled Children at the University of Minnesota and of the Gillette State Hospital, among the finest institutes of their kind in the United States for the care of crippled children. Admittance to these institutions is free to those who cannot afford to pay. Needless to remark, admittance to this "clinic" and institute is not free nor even moderately priced for anyone, though the price in cash that victims must pay is of no importance at all beside the tragic price in hopelessly crippled bodies.

This criminal assault upon the ignorance and anxiety of the families of "polio" victims is much more smooth and insinuating than that of the blatant old fashioned fake. Nowadays Dr. "Curem" is head of a "famous clinic" and, no matter what the misused word "clinic" may mean to the profession, to the gullible public it conveys an idea of scientific mystery and professional repute. Furthermore, Dr. "Curem" says, in a vague grandiose manner, that he is a member of "many learned societies" and to the large number of persons who still do not understand the significance of a County Medical Society roster or an American Medical Association directory, that suffices.

The responsibility for combating this sort of thing rests upon the medical profession and with it, of course, the schools, the church and public health agencies. But the medical profession must lead.

In spite of its long and brilliant public service in improving and standardizing hospitals and medical education, organized medicine has still to educate the public on what it means to be a licensed physician.

The same public that demands certificates of a proper education from its teachers still accepts self-styled doctors without certificates for its healers.

It is a challenge, not only to the private well-being but to the public conscience of the licensed physician, and organized medicine must meet it.

L. Sogge

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE
A. S. HAMILTON, M.D..........Minneapolis
D. C. BALFOUR, M.D..........Rochester
J. T. CHRISTISON, M.D..........St. Paul
E. L. GARDNER, M.D..........Minneapolis
JOHN M. ARMSTRONG, M.D..........St. Paul
R. E. FARR, M.D..........Minneapolis

CARL B. DRAKE, M.D., St. Paul..........Editor
Lewis M. Daniel, M.D., Minneapolis..........Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna..........First District
F. M. Manson, M.D., Worthington..........Second District
Geo. B. Weiser, M.D., New Ulm..........Third District
H. B. Aitkens, M.D., LeSueur Center..........Fourth District
F. U. Davis, M.D., Faribault..........Fifth District
E. L. Gardner, M.D., Minneapolis..........Sixth District
Paul Kenyon, M.D., Wadena..........Seventh District
O. E. Locken, M.D., Crookston..........Eighth District
E. L. Tuohy, M.D., Duluth..........Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV November, 1931 No. 11

THE POLIOMYELITIS SITUATION

Minnesota is still in the midst of an epidemic of poliomyelitis which is almost nation-wide. The New England states and New York have especially suffered and Minnesota has had more cases in proportion to population than her neighboring states. The State Board of Health reports 636 cases with forty-three deaths this year up to October 15, thirty cases and six deaths having been reported the first six months of the year.

The epidemic first made its appearance in and around Duluth the last of July, although there were more than the usual number of sporadic cases in the state during the first half of the year. The following figures show that the epidemic reached its height at Duluth in August, at Saint Paul in September, and apparently somewhat later in Minneapolis.

	Duluth	Saint Paul	Minneapolis
July	11 (2)*		
August	44 (3)	38 (3)	21
September	29	120 (7)	25 (3)
October 1-15	5	30 (3)	25

*Bracketed figures represent deaths.

Scattered cases have been reported from all over the state, few counties having escaped. The weekly totals were higher the first week in October than many preceding weeks. From the standpoint of the appearance of first symptoms, however, it is quite probable that the peak of the epidemic in the state was reached about the first of October.

The mortality of the epidemic so far has been about 6 per cent and is lower than that for the sporadic cases reported during the first half of the year. The explanation may be in the fact that more mild cases are overlooked in the absence of an epidemic. It is not an unusual experience to elicit histories of illnesses which must have been mild attacks of the disease in other children of a family with perhaps one child paralyzed.

At this time it is impossible to state what percentage of the cases reported had no paralysis but it is safe to say it will be considerable. Muscle paralysis, or weakness, loss of or diminished reflexes are usually rather definite. Stiff neck, fever and increased cell count in the spinal fluid is generally recognized as indicative of the presence of poliomyelitis. There are certainly borderline cases which are impossible to diagnose.

The use of convalescent serum seems to be the only generally accepted specific method of treatment. Dr. McKinley's proposal for the wholesale immunization of children in the presence of an epidemic, the details of which were presented in an article in the October number of Minnesota Medicine, has attracted considerable attention. The technic outlined is rather impracticable, especially in the territory outside of the larger cities. Traveling units from the State Board of Health with the necessary equipment are expensive and the demand for such service would all come at about the same time.

It does seem as though a demonstration of the value of the method in selected smaller communities during a widespread epidemic would be decidedly worth while. If the results showed the production of a passive immunity of long enough duration and a simpler technic to be just as efficient, the method could be put into general use.

Some day the etiological organism in poliomyelitis will be discovered. Then the hope of prevention will lie in universal immunization through vaccination.

MORE HUMANISM IN MEDICAL SOCIETIES

We quote from the Valedictory Address of the retiring president of the Hennepin County Medical Society, Dr. Stephen H. Baxter, which appeared in the Bulletin of that Society of October 10:

> I would like to suggest that we put a little more humanism into our Society. It ought to be more than an organization to which we pay, under a certain amount of compulsion, certain dues; whose meetings we attend, in a perfunctory way, once a month. It ought to be a place where animosities can be broken down, jealousies forgotten, personalities overlooked,—where all can unite for the welfare of our profession, and in so doing we will best be serving our own personal interests and those of the public. In the direction of putting more humanism into the Society, I would like to have the scope of some committee (possibly the Entertainment Committee) enlarged so that one of its functions would be to make personal contacts, in the name of the Society, with members who are sick. According to our present practice, the names of members who are sick, and who may be permanently incapacitated, may be dropped from the rolls after receiving a certain number of notices of delinquency. True, members who are permanently disabled may "at their own request" become emeritus members, but who would want to be an emeritus member of a Society that took no cognizance of his misfortune except "at his own request"? Certainly, one of the functions of our Society, if it is to perform its full ethical obligation, is to show a little human interest in its members without waiting until they are totally and permanently disabled or are threatened with expulsion for non-payment of dues.
>
> I would suggest, also, that the names of members who have attained the required age and years of membership in the Society be automatically transferred to the list of emeritus members, and that a letter be sen to such members notifying them of this action and stating that it is done as a mark of honor in recognition of long service. Would this not be a friendly gesture toward our older members more becoming a Society like ours than to require that such recognition be given "at their own request"? Then let them continue as active members at their own request, which doubtless, some of them would elect to do.

The proposal is so well put that comments are rather superfluous.

A case in point. A physician died recently at the age of seventy-five, having been a member of his local county society some twenty-three years Perhaps because of ill health or declining practice or both his name was on the list for reinstatement since he had previously been suspended for failure to pay his dues. Before he was reinstated he died. A committee such as Dr Baxter suggests ought to have humanized his society relation a bit. Surely society membership should mean much more than the phrase in one's obituary notice, "He was a member of his local county society."

OUR ERROR

In the last issue of MINNESOTA MEDICINE the opinion was twice expressed (two errors) that the A. M. A. Directory might add to its value if more complete. The inquiry was made from headquarters—how? Upon careful investigation of the data given in the Directory and comparison with other directories, which, by the way, are few in numbers, we are forced to admit that the additional information contained in other directories, even at twice the price, is non-essential. One of these carries the list of scientific publications, undergraduate fraternities, et cetera, the inclusion of which in the already large A. M. A. Directory would be prohibitory.

We imagine that we were not alone in our lack of appreciation of the actually extensive amount of information about ourselves which this volume contains. The interpretation of the system of symbols employed is not very difficult but does require a little concentration. This method keeps the volume down to a manageable size. It contains information about all physicians who have been licensed and not just the best of us according to some layman's opinion. The data are as reliable as is humanly possible and are made up-to-date every two years.

Our apologies are tendered the editors of this remarkable volume and we admit we have no constructive criticism to make.

There—we feel better.

OBITUARY

Albert Kumpf

1901-1931

Dr. Albert Kumpf, formerly of Minneapolis, died Monday, October 12, at his home in Hot Springs, South Dakota.

Dr. Kumpf was born at New Hampton, Iowa, and had lived in Minneapolis for eleven years before making his home in South Dakota last year. He was a graduate of the medical school of the University of Minnesota and had served there as an instructor for three years after his graduation. He was a member of Alpha Omega Alpha, honorary fraternity, and of the Trinity Lutheran church.

Surviving are his wife, his parents, Mr. and Mrs. Louis Kumpf, and a sister, Elizabeth, all of Minneapolis.

Silas E. Brown

1856–1931

Dr. Silas E. Brown, 75 years old, a physician and surgeon in Saint Paul more than twenty years, died Saturday, October 10, 1931, at his home in Saint Paul after a brief illness. He died in active practice, as he wished. On the Wednesday preceding his death he gave medical testimony in court for an hour and had scheduled himself to see patients on the following four days.

Dr. Brown was born in Heuvelton, N. Y., February 24, 1856. He received his early education in local schools and at the Pottsdam, New York, Normal School. He began his medical studies at McGill College, Montreal, where he was a student under the famed Sir William Osler. He told of how Sir William used to make him and his fellow students shed their coats and go to work at the city morgue, lecturing as they performed autopsies. After his second year at McGill he transferred to New York University Medical School, where he was graduated in 1883.

For twenty-five years he practiced in Ogdensburg, N. Y. He was appointed by the United States government as marine surgeon and United States health officer in 1884, and coroner of St. Lawrence County in the same year. In these capacities he served for twenty-five years before moving to St. Paul. While in Ogdensburg he was also president of the St. Lawrence County Medical Society and of the Northern New York Medical Society. He was lecturer for the St. Lawrence State Hospital for the insane and examiner for various insurance companies. After moving to St. Paul he was appointed railway surgeon, and examiner for several insurance companies, was a member of the Minnesota Medical Society and the Ramsey County Medical Society. He was a Mason and an elder in the House of Hope Presbyterian Church.

Surviving are his widow, Mary Macon Brown, and two daughters, Josephine Brown of New York, staff secretary of the National Family Welfare Association, and Marion Brown MacLean of Milwaukee.

Soren P. Rees

1870-1931

Dr. Soren P. Rees, physician and surgeon, died Friday night, October 2, 1931, at his home, 1715 West Franklin avenue, in Minneapolis, following an illness of three months. He was 61 years old.

For a number of years Dr. Rees was a member of the faculty of the medical school of the University of Minnesota, and had been a member of the staff of Swedish hospital since that institution was founded. He was chief of medicine on the staff of General hospital for some time.

Dr. Rees was born September 27, 1870, at Vejle, Denmark. When a boy of eleven, he was brought to the United States by his parents, who established residence in Stillwater, Minn., in 1881.

He matriculated at the University of Minnesota in 1890, and entered the medical school in 1895, being graduated with the class of 1897. Until June of 1898 he served his interneship at St. Barnabas hospital. Dr. Rees completed one year of postgraduate work in Vienna. He then entered the practice of medicine at Anoka, Minn. In 1901 he moved to Minneapolis and opened an office. While a student at the university, he was assistant registrar under E. Bird Johnson. When later he became a member of the faculty he gave instruction in physical diagnosis.

Dr. Rees earned his own living while attending both high school and the university and was graduated with honors as a member of Phi Beta Kappa, national honorary scholastic fraternity, and the medical fraternity of Phi Beta Pi. He also was a member of Theta Delta Chi, national academic fraternity, of which he was a charter member at Minnesota.

Dr. Rees was a member of the Hennepin County Medical Society, the Minnesota State Medical Association, the Minnesota Academy of Medicine and the American Medical Association.

Aside from his professional work he was interested in the fine arts. He was a life member of the Minneapolis Institute of Arts, and was a founder and secretary of the Scandinavian Art Society of America. He was a deacon of Trinity Baptist church.

Surviving him are his wife, Estelle Crocker Rees, whom he married in 1898; a son, Douglas, and a sister, Mrs. Clara Anderson, of Stillwater.

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

The energy and ambition of the Women's Auxiliary to the State Association is obvious in the very complete and thoughtful supplement now under discussion in Minnesota to the Official Health Program of the Women's Auxiliary to the American Medical Association.

Where the national program, outlined on this page last year, indicated broadly the part of the Auxiliary in the important business of Public Health Education, this state supplement is specific and definite. Minnesota women propose to know with great minuteness the problems of the medical profession in this state and their own part in solving them. If the study is carried on as intelligently as it is begun in this outline, women of the auxiliary should be better equipped than many of the physicians whose problems they are studying to assist with the business of public health education by the physician.

Following are the high points in this outline:

THE COMPONENT AUXILIARY:

1. County Medical Society Advisors
2. Joint Meetings
3. Joint Programs

STATE HEALTH RELATIONS:

Dangers of State Medicine
1. In Other Countries—Europe-Canada, U. S.
2. Legislation leading to
   Current Literature
   Cost of Medical Care
   (a) Physician
   (b) Nurse
   (c) Patent Medicine
   (d) Laboratories
   (e) Druggists
   (f) Health Insurance
3. Public Health
   (a) State
   (b) County
   (c) City Dept.
   (d) National Committee
   (e) County Health Unit
   (f) School Nurse
   (g) School Health
4. Relation of County Medical Society and Its Members

PUBLIC HEALTH EDUCATION:

1. Official and Voluntary Health Agencies
2. Contact with Lay Health and Civic Organizations
3. Immunization
   (a) Minnesota Plan
   (b) In other States
      (1) Smallpox
      (2) Vaccination
      (3) Diphtheria
         (a) Our campaign
4. Pre-school Child Examinations
5. Parent-Teacher Associations
   (a) Purpose and Plan
6. Examination Given by Family Physician
7. Follow-up for Correction of Remediable Defects
8. Health Campaigns:
   (a) Heart
   (b) Tuberculosis
   (c) Crippled Children, etc.
9. Period Health Examinations:
   (a) Every Member Should Have an Annual Physical Examination
   (b) Importance of Early Discovery of Disease:
      (1) Cancer
      (2) Heart
      (3) Tuberculosis, etc.
10. Medical Ethics
   (a) The Medical Society and Auxiliary
   (b) The Physician
   (c) The Physician's Wife
11. Medical Legislation
   (a) National:
      (1) Jones-Cooper Bill
      (2) Sheppard-Towner
      (3) Vivisection
      (4) Cultists
      (5) State Basic Science Law
      (6) New Medical Practice Act, etc.
      (7) 1931 Recommendations for Northwest Regional Conference.

As Auxiliary members we should be interested in the following topics, and study them—

STATE BOARD OF CONTROL:

1. Its Functions?
2. Institutions
   (1) Insane Asylums
   (2) School for Feeble Minded—Faribault
   (3) School for the Deaf—Faribault
   (4) School for the Blind—Faribault
   (5) Colony for Epileptics at Cambridge
   (6) Training School at Red Wing
   (7) Home School for Girls—Sauk Center
   (8) Public School—Owatonna
3. Tuberculosis:
   Dr. Arnold S. Anderson, Secretary of the Tuberculosis Division, State Board of Control, is available for talks, as are also the various superintendents of the Tuberculosis Sanatoria in the different parts of the State.
4. Crippled Children:
   The Gillette Hospital for Crippled Children in St. Paul also comes under the State Board of Control, and members of its staff are available for talks.
   In addition there is the Shrine Hospital for Crippled Children and also the Eustis Hospital in connection with the University of Minnesota.
   The Crippled Child is receiving much attention from many lay groups. Have you made a study of legislation pertaining to crippled children, also a survey of institutions caring for the crippled child. You may find the subject of vast interest and be

able to do much better work for your clubs and Parent-Teacher Associations if you study the problem from the standpoint of the State Medical Association and the Auxiliary.

MINNESOTA STATE BOARD OF HEALTH:

1. Personnel? How Selected?
2. Functions:
   What help should a rural community naturally expect from our State Board of Health?
   (1) Pure Milk Program
      (a) Laws Governing the Handling of Milk in Minnesota
      (b) What is Certified Milk?
      (c) What is Pasteurized Milk?
      (d) Do You Know the Story of Tuberculosis Testing of Cows in Minnesota?
   (2) Sanitation Laws?
   (3) Water Supply Laws?
   (4) Communicable Disease Laws?

UNITED STATES PUBLIC HEALTH SERVICE:

1. Personnel? How Selected?
2. Functions?
   (a) What Help in Auxiliary Work?
   (b) What is the U. S. Veterans Bureau?

MINNESOTA PUBLIC HEALTH ASSOCIATION:

1. Personnel? How Selected?
2. Duties:
   (a) What Help in Auxiliary Work?

MINNESOTA STATE MEDICAL ASSOCIATION:

1. Personnel?
2. Duties of Committees?
   (a) Many Doing Specific Line of Work.
   (b) Of General Interest to Auxiliary Workers are:
      (1) Committee on Hospitals and Medical Education
      (2) Committee on Public Policy and Legislation
      (3) Committee on Public Health Relations and Education
      (4) Committee on State Health Relations
      (5) Heart Committee
      (6) Committee on Public Health Nursing

The Committees of importance to the Auxiliary under the Minnesota State Medical Association are listed above, and the Chairmen would be happy to explain to the Auxiliaries the functions of their committees.

The office personnel of the Executive Secretary of the Minnesota State Medical Association and the Minnesota Public Health Association at 11 West Summit Avenue, St. Paul, under the personal supervision of Dr. E. A. Meyerding, is ready at all times to help you get your program problems in shape. They will help you select speakers, reading material, and helps of many kinds, on all topics in the foregoing outline.

If as an Auxiliary you meet at the same time as your County Medical Society, it would be wise to select a program chairman from your group, to keep in touch with the program chairman from the Medical Society, and plan to have the speaker for the Doctors' program give the Auxiliary some time, asking him to give you a definite topic. This time can very easily be arranged for while the Medical Society is holding its business meeting.

Many Auxiliary groups are taking topics from *Everybody's Health*, *Hygeia*, and MINNESOTA MEDICINE, asking members to review them, with an open discussion following.

Dr. Meyerding has a number of books in his office library that would make excellent books to review for Auxiliary programs and folders on three hundred subjects suitable for health talks, are on file. Upon request, material will be loaned to members of the Auxiliary.

FEDERAL SCIENTISTS TELL HEALTH ASSOCIATION OF RECENT FINDINGS

Oranges produced by trees sprayed with lead arsenate not only differ in chemical composition from normal oranges, but suffer a considerable loss of Vitamin C content which is regarded as such a highly desirable constituent of oranges, Dr. E. M. Nelson and Mr. H. H. Mottern of the Bureau of Chemistry and Soils, U. S. Department of Agriculture, recently told members of the American Public Health Association in session at Montreal.

Doctor Nelson's statement followed completion of a series of experiments in the Bureau of Chemistry and Soils which have demonstrated that, besides causing a considerable loss of the valuable Vitamin C, spraying orange trees with lead arsenate reduces the acidity of the juice and decreases the sucrose with a corresponding increase in invert sugar. The principal orange producing States have laws prohibiting the use of arsenical sprays on this crop.

The spraying of oranges with lead arsenate involves no danger from arsenic poison, according to the findings of the bureau, which disclosed no arsenic in the edible portion of the orange following many applications of spray to orange trees.

Another interesting fact brought out by the recent investigation of the Department of Agriculture's chemists which Doctor Nelson announced today is that the processing of oranges, by the heat method of the department's Plant Quarantine and Control Administration, to destroy larvæ of the Mediterranean Fruit Fly during the recent eradication campaign against that pest did not change the character of the sugars, citric acid, or Vitamin C content of the fruit.

OF GENERAL INTEREST

A son, James Elwyn, was born to Dr. and Mrs. Elwyn V. Strand, Bayport, Minnesota, on August 16, 1931.

Dr. George E. Malmgren, formerly with the Mayo Clinic, has moved to Los Angeles, where he will practice proctology.

Dr. B. R. Kirklin of Rochester was elected first vice-president of the American Roentgen Ray Society at its recent meeting held in Atlantic City.

Dr. and Mrs. Chester M. Carlaw, Minneapolis, have returned from Montreal, where Dr. Carlaw attended the fortieth reunion of his class at McGill University.

Paul H. Fesler, Superintendent of the University of Minnesota Hospital, was installed as president of the American Hospital Association at its meeting in Toronto, October 2, 1931.

Doctor Russell M. Wilder has resigned his position as Professor of Medicine at the University of Chicago to join the staff of the Mayo Clinic and the Faculty of the Mayo Foundation Graduate School of the University of Minnesota as Professor of Medicine.

Dr. Arthur C. Strachauer and Dr. William R. Jones announce the opening of their offices on October 1, 1931, at 350 Medical Arts Building, Minneapolis, for the practice of general surgery. Dr. Strachauer has recently been appointed Chief Surgeon of the Soo Line Railway.

Dr. Strachauer has returned from the annual meeting of the directors of the American Society for the Control of Cancer, which was held in New York City October 10 to 14; also the annual meeting of the Conference on Cancer Clinics of the American College of Surgeons.

The new Bethesda hospital, Saint Paul, is well on the way toward completion. The $500,000 building on Capitol Avenue, between Como Avenue and Viola Street is being erected on a hill and will tower high in the air so that it can be seen for miles. No definite date has been set for completing the building.

The Clarkfield Community Hospital, Clarkfield, Minnesota, was dedicated Sunday afternoon, September 27, with appropriate exercises. The building was erected at a cost of $15,000 and contains fifteen rooms. Dr. Malvin I. Hauge and Dr. M. M. Hauge of Clarkfield are members of the staff of the hospital.

Kappa Phi chapter of Phi Chi, national medical fraternity, has just opened a new $40,000 fraternity house at 325 Harvard Street S. E., Minneapolis, for undergraduate members at the University of Minnesota. The building, of the English town house type, was designed by C. P. Pesek. The exterior is of skintled brick with Bedford trim. The Fraternity held an open house in October.

Award to a former St. Paul physician of a gold medal emblematic of first place in a medical essay contest and a cash prize of $500 was announced Saturday by the Association of Military Surgeons.

The winner is Colonel George A. Skinner of the Army Medical Corps, stationed at the Seventh Corps Area Headquarters in Omaha. The contest, conducted by the association, was for essays on "The Influence of Epidemic Diseases on Military Operations in the Western Hemisphere."

Twenty-four hospitals of the Twin Cities have met the standards required for full approval by the American College of Surgeons, it was announced October 12, by Dr. Franklin H. Martin, director general of the college, at the opening session of the twenty-first annual clinical congress of surgeons in New York.

Of the twenty-four fully approved institutions thirteen are Minneapolis institutions, and eleven are in St. Paul. The Minneapolis hospitals placed on the list are Abbott, Asbury, Eitel, Fairview, Hill Crest, Lutheran Deaconess, St. Mary's, Shriners' Hospital for Crippled Children, Maternity, Minneapolis General, Northwestern, University and Veterans.

St. Andrews, St. Barnabas and Swedish hospitals, Minneapolis, have been placed on the list as having accepted the minimum requirements laid down by the American College of Surgeons.

St. Paul hospitals fully approved are Ancker, Bethesda, Miller, Children's, Gillette Hospital for Crippled Children, Midway, Mounds Park, Northern Pacific, St. John's, St. Joseph's and St. Luke's.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

LAWYER ARRESTED FOR ALLEGED VIOLATION OF BASIC SCIENCE LAW

State of Minnesota *vs.* John Hugh Lally

On September 14, 1931, a complaint was filed in the Municipal Court in Minneapolis alleging that one John Hugh Lally had practiced healing without a Basic Science Certificate.

The defendant in this case is a lawyer licensed in the State of Illinois who has been touring the country giving health lectures and claiming to be engaged in spiritual healing.

Lally was held to await the action of Grand Jury by Judge Wright of the Municipal Court. Following a preliminary hearing his bail was set in the sum of $1,250. Following Lally's arraignment in District Court, where he entered a plea of not guilty, a motion was made by the defendant to quash the information against him.

On September 28, the date set for the trial, counsel for the defendant informed the Court that Lally had left for Detroit, Michigan.

Judge Guilford ordered the defendant's bail forfeited and a bench warrant issued for his arrest.

Lally has been previously convicted of violating the Medical Laws in Chicago, Illinois, and Winnipeg, Manitoba, Canada.

MINNEAPOLIS WOMAN FINED ONE HUNDRED DOLLARS FOR VIOLATING BASIC SCIENCE LAW

State of Minnesota *vs.* Mayme F. White

On September 25, Mayme F. White, 61 years of age, unlicensed, and living at 512 Forest Ave., Minneapolis, entered a plea of guilty to practicing healing without a Basic Science Certificate before the Honorable Horace D. Dickinson, Judge of the District Court. Mrs. White claimed that she was a Spiritualist and had been practicing magnetic healing. However, in the present case, roots and herbs and some pills had been prescribed for the patient. Judge Dickinson imposed a fine of $100 or ninety days in the Minneapolis Work House, with the defendant paying the fine. The Court also warned the defendant against violating the medical laws in the future. The Court instructed the defendant that the practice of healing was regulated by law and required a license and that she undoubtedly would be prosecuted with more serious consequences for a second violation. The records in the Probate Court disclose that Mrs. White had filed a claim against an estate in the sum of $167 for services, but the claim was not allowed by the Court.

NEW AND NON-OFFICIAL REMEDIES

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Non-official Remedies:

Abbott Laboratories
- Neocinchophen-Abbott Tablets, 7½ grains

Lederle Laboratories, Inc.
- Diphtheria Toxoid, two 1 c.c. syringe packages
- Diphtheria Toxoid, two 1 c.c. vial packages
- Diphtheria Toxoid, one syringe package
- Diphtheria Toxoid, one vial package
- Solution Liver Extract Parenteral (Lederle)

E. R. Squibb & Sons
- Diphtheria Toxin for the Schick Test, Ready to Use without Dilution
- Scarlet Fever Streptococcus Toxin-Squibb, six 10 c.c. vial packages
- Squibb Liquid Petrolatum with Agar and Phenolphthalein

Pentobarbital-Sodium — Sodium ethyl (1-methylbutyl) barbiturate. Sodium ethyl (methylpropylcarbinyl) barbiturate. The monosodium salt of ethyl-(1-methylbutyl) barbituric acid. Pentobarbital-sodium differs from barbital, U.S.P. (sodium diethylbarbiturate) in that one of the ethyl groups of the latter is replaced in the former by a 1-methylbutyl group. The actions and uses of pentobarbital-sodium are essentially similar to those of barbital, but it is effective in smaller doses. The action is of relatively brief duration, which may constitute an advantage, especially when relatively large doses are administered. It is used as a sedative, particularly prior to local, general or spinal anesthesia. It can be used safely for such purposes only by those who have had adequate experience and who are familiar with the literature concerning such use. The drug may be administered by mouth or rectum; intravenous injection is considered unsafe.

Capsules Pentbarbital-Sodium-Abbott, 1½ grains.—Each capsule contains pentobarbital-sodium-N.N.R., 0.1 Gm. (1½ grains). Abbott Laboratories, North Chicago, Ill.

Pulvules Pentobarbital-Sodium-Lilly, 1½ grains.—Each pulvule (capsule) contains pentobarbital-sodium-N.N.R., 0.1 Gm. (1½ grains), and starch, 0.13 Gm. Eli Lilly & Co., Indianapolis, Ind. (Jour. A. M. A., September 5, 1931, p. 705.)

Skiodan.—Methiodal.—The sodium salt of mono-iodo-methane-sulphonic acid. Skiodan contains 52 per cent of iodine. It is proposed as a therapeutically indifferent medium for roentgenography, especially for visualization of the urinary tract, either by intravenous injection or by direct injection into the renal pelvis through a ureteral catheter. It has also been administered rectally. Winthrop Chemical Co., Inc., New York.

Gynergen Solution 0.1 Per Cent.—Each c.c. of solution contains 1 mg. of gynergen (New and Non-official Remedies, 1931, p. 183) and a small excess of tartaric acid. Sandoz Chemical Works, Inc., New York.

Squibb Chocolate Vitavose.—A mixture of Squibb's vitavose (New and Non-official Remedies, 1931, p. 245) 30 per cent, with cocoa, milk solids and sucrose. E. R. Squibb & Sons, New York. (Jour. A. M. A., September 12, 1931, p. 779.)

Scarlet Fever Streptococcus Toxin-Squibb (New and Non-official Remedies, 1931, p. 370).—This product is also marketed in packages of six 10 c.c. vials of toxin containing, respectively, 500, 2,000, 8,000, 25,000, 40,000 and 40,000 skin test doses per c.c. E. R. Squibb & Sons, New York. (Jour. A. M. A., September 26, 1931, p. 930.)

CONSULTATION BUREAU

WM. A. O'BRIEN, M.D., *Director*
Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

1. *Question.*—Please give me some information concerning the present conception of the cause, diagnosis, treatment, and prognosis of hay fever. Many of my patients have asked me about the possibilities of preventing next year's attacks. I would, also, like to know something about perennial desensitization.

Answer.—Both hay fever and asthma are manifestations of a hypersensitiveness to some foreign substance. At the present time, there is a widespread and critical interest in these conditions. This has greatly increased our knowledge of these diseases and has led to marked improvement in treatment. Both are manifestations of what has been variously termed anaphylaxis, allergy, atopy, idiosyncrasy, and the phenomena of hypersensitiveness.

Hay fever is a symptom-complex characterized by red eyes, obstructed nose, paroxysmal sneezing, and nasal discharge of a watery secretion which occurs each year at a definite season and depends upon the fact that the patient is hypersensitive to the pollen of one or more plants which blossom at that time. Allergic coryza is a less specific term, which is ordinarily applied to those patients whose symptoms are not necessarily limited to the summer months but are due to other irritants. Perennial hay fever or chronic vasomotor rhinitis resembles hay fever but is due to a different cause.

Hay fever was the first of the manifestations of allergy to be recognized. It has been known for some time that plant pollens are responsible. The most characteristic feature of hay fever due to pollens is the time of the attack each year. The precise seasons vary with the vegetations of various parts of the country. The usual complaints are located in the nose and eyes. Other symptoms equally characteristic are intense itching of the palate and fauces, a reddish eruption in the mouth, difficulty in swallowing, ear disturbances, including deafness, and asthma. The latter may be considered as an extension of the hay fever process when it occurs only in conjunction with the former disease. It is important to remember that occasionally only isolated features of the hay fever syndrome are present. The seasonal association of even one of these symptoms may be significant.

Pollen is the germ cell of the male plant. Ordinary flowering plants, because of time factors, seldom show self-pollination. Cross pollination is usually effected by insects, birds, and the wind. Ragweed usually has separate male and female plants, the males being more numerous. Most of the grasses and weeds are wind pollinated. Weather has a very important effect upon the concentration of the pollen in the air—rain frees the air of pollen but it makes the weeds grow, and when the sun comes out more pollen than ever is produced. Hay fever is always milder in rainy, cloudy weather. Wind usually increases the symptoms. Patients are usually better in the city than in the country. In any attempt to enforce weed laws, this factor is very important.

Before attempting to get any assistance from the patient's history as to the pollen factor, it is necessary to know the time of pollination in Minnesota. As a general rule, the trees are responsible for the earlier attacks, the grasses for the midsummer disease, and the weeds, notably the ragweed, for the late summer and early fall attacks. Patients frequently state that their hay fever begins on the same date each year. This is of great assistance in making a specific diagnosis. It is interesting that ragweed does not occur in Europe. Travelers returning from abroad during the hay fever season frequently have their first attacks some distance out at sea because of air currents out from shore. Certain sections of the United States are free of ragweed and are sought by sufferers on this account.

There are two ways of finding out the etiology of pollen-sensitive patients, one by skin tests and the other by history. The patient should be treated for that particular pollen which is causing his symptom. Crossed reactions are frequent and skin tests may be positive when the patient is not sensitive. At the present time, no definite method of selection of the proper pollen is satisfactory. Close immunological relationships occur between various grasses and between various weeds. Immunization against one may be effective against others. All of these points are very confusing at the present time and make specific treatment rather difficult. Both pre-seasonal and co-seasonal treatment offer relief.

Symptomatic treatment (nonspecific) includes direct cauterization of the mucous membrane, sprays of adrenalin and ephedrin, cocaine, eye astringents, and general measures. Other drugs which have been used are bromides, acetylsalicylic acid, nitrohydrochloric acid, sodium bicarbonate and ephedrin by mouth, and local applications of radium or X-ray in small doses to the eyes and nose. There is such a great variability in the individual reactions of patients that treatment should be used accordingly. Many milder forms do not require specific treatment. There is a large group, seriously disabled by the disease, and for them specific therapy is not a question of choice but a necessity.

Allergy is usually a hereditary affliction. Very little can be done about this. Dust-free rooms may be developed and are said to be useful. Even a few hours, freedom may induce comfort for the entire day. Some sufferers spend a few hours daily in cold storage plants. The temperature is probably not as important as the poor ventilation in giving relief. Others wear masks. Desensitization is the process by which the reaction of the patient to the defending substance is modified. No treatment could be successful unless the extract used is made from the particular substance responsible. Subcutaneous serial injections are made usually about six to ten weeks before the expected time of appearance. The size of the first dose is based upon the tolerance. The number of doses and the interval

(Continued on page 1019)

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of November will be as follows:

November 4—Fracture of Skull.
November 11—What are the Psychoneuroses?
November 18—Prevention of Eye Strain.
November 25—Treatment of Leukemia.

MINNESOTA SOCIETY OF INTERNAL MEDICINE

The semi-annual meeting of the Minnesota Society of Internal Medicine will be held in the Ramsey County Medical Society rooms in the new Lowry Building, Saint Paul, November 1, 1931.

The session begins at 9 a. m. and will be followed by dinner at 6 p. m. at the Town and Country Club, Saint Paul.

Symposia on "Chronic Arthritis" and "Angina Pectoris" are included in a most interesting program.

ASSOCIATION OF RESIDENT AND EX-RESIDENT PHYSICIANS OF THE MAYO CLINIC

Dr. Edgerton L. Crispin of Los Angeles was named president of the Association of Resident and Ex-resident Physicians of the Mayo Clinic and Mayo Foundation at Rochester, Minnesota, Friday, October 9, 1931.

Other officers named are Dr. Clyde Roeder of Omaha, first vice president; Dr. Frank E. McEvoy of Providence, R. I., second vice president; Dr. Thomas J. Kinsella of Oak Terrace, Minn., secretary; Dr. Porter P. Vinson of Rochester, associate secretary and treasurer.

Dr. D. F. Hollenbeck of Rochester was elected to the board of governors, succeeding Dr. Herbert Z. Griffin of Rochester. Other governors are Dr. Frank C. Mann and Dr. Willis S. Lemon, both of Rochester.

Five new members of the advisory board elected are: Dr. L. D. Powell of Des Moines; Dr. Robert E. Moran of Washington; Dr. Carl R. Steinke of Akron; Dr. Eric Larson of Los Angeles, and Dr. Bernard McGrath of Milwaukee.

LYON-LINCOLN COUNTY MEDICAL SOCIETY

At a meeting of the Lyon-Lincoln County Medical Society held Tuesday, October 6, at Marshall, Minn., the following officers for 1932 were elected: President, Dr. C. M. Golden, Tyler; vice president, Dr. Archibald Olson, Hendricks; secretary-treasurer, Dr. H. M. Workman, Tracy; delegate to state meeting, Dr. E. T. Sanderson, Minneota; alternate, Dr. A. L. Vadheim, Tyler; censor for three years, Dr. P. E. Hermanson, Hendricks.

The Society is holding a very successful Clinical Course.

RICE COUNTY MEDICAL SOCIETY

Rice County Medical Society met Tuesday, September 29, at 7:45 P. M., in the Faribault Clinic rooms.

Dr. Waltman Walters, of the Mayo Clinic gave a lecture on "Surgical Aspects of Obstructive Jaundice."

C. J. Plonske, Secretary.

SOUTHWESTERN MINNESOTA MEDICAL ASSOCIATION

Dr. C. A. Slater, superintendent of the Southwestern Minnesota Tuberculosis Sanatorium at Worthington, was named president of the Southwestern Minnesota Medical Association at a meeting held in Slayton, October 10.

Dr. J. T. Rose of Lakefield is the new vice president and Dr. W. E. McKeown of Pipestone was re-elected secretary-treasurer.

ST. LOUIS COUNTY MEDICAL SOCIETY

At the annual meeting of the St. Louis County Medical Society held recently election of officers resulted as follows:

President, Norven H. Gillespie, Duluth; first vice president, Franklin Raiter, Cloquet; second vice president, O. L. McHaffie, Duluth; secretary-treasurer, M. McC. Fischer, Duluth.

Censors: Dr. A. E. Olson, Duluth; Dr. L. L. Merriman, Duluth; G. C. MacRae, Duluth.

Delegates: Dr. C. L. Haney and Dr. F. J. Elias, Duluth. Alternates: Dr. W. G. Strobel, Dr. W. N. Graves, Dr. Robert S. Forbes, and Dr. L. A. Barney, all of Duluth.

M. McC. Fischer, M. D., *Secretary.*

STEARNS-BENTON COUNTY SOCIETY

The regular meeting of the Stearns-Benton County Medical Society was held in Sauk Rapids, September 24, 1931. Dr. H. B. Clark gave a talk on the "Treatment of Syphilis"; Dr. F. J. Schatz reported five cases of Intestinal Obstruction in Infants; and Dr. F. H. Stangl discussed the "Uses of the Drinker Respirator."

Wm. H. Rumpf, M.D., *Secretary.*

WASHINGTON COUNTY SOCIETY

The regular monthly meeting of the Washington County Medical Society was held in Stillwater on September 8, 1931. The business part was taken care of during and after dinner, after which one of our own members, Dr. Carnot H. Sherman, gave an instructive talk. Dr. Sherman has just returned from Philadelphia where he spent two years at the Post Graduate School, Medical Department, University of Pennsylvania, where he received a diploma as Master of Medical Sciences in Surgery at his graduation, and also captured the place of honor in the class.

The Doctor described the work laid out for the students at this school, the only one in the country barring the Medical Department of the University of Minnesota, that gives advanced degrees in the specialties. The doctor also spoke on new methods of medication and diagnosis, especially emphasizing new ways of lessening error of diagnosis in interpretation of abdominal pains.

It was all very enjoyable and we are glad to have Doctor Sherman with us again.

E. Sydney Boleyn, *Secretary.*

WRIGHT COUNTY SOCIETY

The Wright County Medical Society held its third quarterly meeting at Delano, Minnesota, July 23, 1931, at 3:00 P. M.

Minutes of the October meeting, 1930, the January and April meetings, 1931, were read and accepted except for some corrections added to the minutes of the April meeting.

Dr. J. W. Olson of Cokato was accepted as a member of the Society. In the absence of the president, Dr. Klaveness of Saint Paul occupied the chair. Dr. Klaveness also made a report to the society about the proceedings of the House of Delegates.

Dr. Wangensteen of the University was the main speaker and gave a very interesting and instructive talk concerning "Diagnosis and Treatment of Intestinal Obstruction," illustrating his talk with lantern slides and charts.

A very profitable meeting.

C. L. Roholt, *Secretary.*

RED RIVER VALLEY MEDICAL SOCIETY

The Fall meeting of the Red River Valley Medical Society was held at the Hotel Evelyn in Thief River Falls, Tuesday, October 6, starting with a luncheon at 1 o'clock. The program, devoted to the newer phases of tuberculosis, was as follows:

"Discussion of Certain Phases of Tuberculosis," Dr. J. A. Myers, Minneapolis; Dr. E. A. Meyerding, Saint Paul; et al.

"Rectal Difficulties in the Tuberculous," Dr. Walter Fansler, Minneapolis.

Presentation of cases by members.

B. L. Oppegaard, M.D., *Secretary.*

PARK REGION MEDICAL SOCIETY

At a recent meeting of the Park Region Medical Society Dr. M. W. Kemp was elected president; Dr. O. V. Johnson, vice-president; Dr. E. A. Heidberg, secretary-treasurer. Dr. A. J. Lewis of Henning was chosen delegate to the state convention in Minneapolis.

NORTHWESTERN PEDIATRIC SOCIETY

The Fall meeting of the Northwestern Pediatric Society was held in Duluth on Saturday, October 10, 1931.

Dinner was served at the Kitchi Gammi Club at 7:00 p. m., followed by the scientific program at St. Luke's Hospital as follows:

1. a. "Scleroderma Neonatorum."
   b. "Agranulocytosis." Case reports.
   Dr. C. H. Schroder, Duluth.
2. "Pneumothorax; Probable Cyst of the Lung." Case Report.
   Dr. C. O. Kohlbry, Duluth.
3. "Eosinophilia with Splenomegaly." Case Report.
   Dr. O. W. Rowe, Duluth.
4. "Hypertension in Children and Its Effect on Eyesight."
   Dr. A. W. Graham, Chisholm.
5. "Meckel's Diverticulum: Report of a Case of Perforation."
   Dr. R. E. Nutting, Duluth.
6. "Latent Tetany of the Newborn."
   Dr. H. A. Sincock, Superior.
7. "Breast Feeding of the Newborn."
   Dr. C. A. Scherer, Duluth.

Alexander Stewart, *Secretary.*

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

WASHINGTON COUNTY AUXILIARY

The Woman's Auxiliary to Washington County Medical Society was hostess at a bridge party, Tuesday, September 29, for the benefit of the Lakeview Memorial Hospital. Mrs. S. S. Hesselgrave, past state president; Mrs. James Blake, state president; Mrs. Edward Schons, of St. Paul, president-elect; and Mrs. W. H. Hengstler, president of the Ramsey County Auxiliary, were guests.

EASTERN MINNESOTA AUXILIARY

The doctors' wives from the Central Minnesota and Chisago-Pine County Medical Societies were invited to accompany their husbands to a dinner meeting at Cambridge, Thursday, September 17. With the assistance of Mrs. Hesselgrave, past state president, the women organized an auxiliary to the new Eastern Minnesota Medical Society. The following officers were elected: President, Mrs. H. C. Cooney, Princeton; vice president, Mrs. Charles Swenson, Braham; secretary-treasurer, Mrs. H. J. Kooiker, Milaca.

BLUE EARTH COUNTY AUXILIARY

Dr. E. A. Meyerding addressed the women of the Blue Earth County Medical Society Auxiliary at Mankato, October 5. He gave an interesting talk on the duties of auxiliary members. The auxiliary meeting was held concurrently with the doctors' meeting, and the two groups joined for a buffet luncheon.

WRIGHT COUNTY AUXILIARY

The annual meeting of the Wright County Medical Auxiliary was held October 6 at the home of Dr. and Mrs. Catlin at Buffalo. The meeting was called at four o'clock, and the work of the auxiliary discussed. Mrs. F. E. Ellison of Monticello was elected president, and Mrs. J. J. Catlin secretary and treasurer. A buffet supper was served.

RICE COUNTY AUXILIARY

The first annual meeting of the Rice County Auxiliary was held at Faribault, Wednesday, October 14, and took the form of a benefit bridge luncheon at the Hotel Faribault.

WEST CENTRAL AUXILIARY

On October 14 the West Central Medical Auxiliary held a dinner meeting at Morris. Dr. Emil Geist addressed the members.

STEELE COUNTY AUXILIARY

The Woman's Auxiliary of Steele County met at Owatonna, October 16, at the home of Mrs. E. W. Senn. Mrs. James Blake, state president, presented her program for the coming year.

BLUE EARTH VALLEY AUXILIARY

On October 8 the wives of the members of the Blue Earth Valley Medical Society met at dinner at the Hotel Constance for the purpose of forming an auxiliary. Mrs. Blake and Mrs. Hesselgrave were present and the following officers were elected: President, Mrs. R. C. Farrish, Sherburn; vice president, Mrs. A. J. Henderson, Kiester; secretary-treasurer, Mrs. H. B. Bailey, Fairmont.

RED RIVER VALLEY AUXILIARY

A dinner meeting of the Red River Valley Medical Auxiliary was held at Thief River Falls, October 6. Dr. Meyerding and Mrs. Hesselgrave were the speakers.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

SECTION SUPERVISORS

EYE, EAR, NOSE AND THROAT

Virgil J. Schwartz, M.D.
617 Medical Arts Bldg.
Minneapolis, Minnesota

Merritt Wheeler, M.D.
1027 Lowry Med. Arts Bldg
Saint Paul, Minnesota

GYNECOLOGY AND OBSTETRICS

Archibald L. McDonald, M.D.
Lyceum Building
Duluth, Minnesota

L. W. Barry, M.D.
810 Lowry Medical Arts Bldg.
Saint Paul, Minnesota

MEDICINE

Richard Bardon, M.D.
205 West Second Street
Duluth, Minnesota

Thomas A. Peppard, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

PEDIATRICS

Chester A. Stewart, M.D.
951 Medical Arts Bldg.
Minneapolis, Minnesota

Roy N. Andrews, M.D.
Mankato Clinic
Mankato, Minnesota

ROENTGENOLOGY

Leo G. Rigler, M.D.
University Hospital
Minneapolis, Minnesota

J. D. Camp, M.D.
Mayo Clinic
Rochester, Minnesota

SURGERY

A. E. Sohmer, M.D.
Mankato Clinic
Mankato, Minnesota

O. J. Campbell, M.D.
Medical Arts Bldg.
Minneapolis, Minnesota

EYE, EAR, NOSE AND THROAT

THE OCCURRENCE OF EYE LESIONS IN TUBERCULOUS PATIENTS: W. V. Moore (Am. Jour. Oph., 1931, Vol. 14, July, p. 596). Tuberculous eye lesions are rarely found among patients under treatment for active pulmonary tuberculosis. When patients with definite tuberculous eye lesions are thoroughly examined quiescent or healed lesions are frequently found in the lungs, tracheo-bronchial and hilus lymph glands. These primary foci may not produce constitutional symptoms, but are capable of discharging a few attenuated organisms into the circulation. It is probable that both the organisms and their toxic products may have some influence in producing lesions.

Finoff reported ocular tuberculous lesions of a severe and progressive type in rabbits following tubercle bacilli injected into the carotid; dead bacilli injected produced similar lesions but of a chronic course, resulting in scar formation.

Stark believed the foci too trifling in nature to produce enough toxin to stimulate antibody development, the bacilli having become attenuated and less virulent than those producing the initial lesion, producing little resistance to its invasion of other parts.

Kruckmann reported years in sanatoria and clinics where active pulmonary cases were treated without observing a single ocular case; in eye clinics where ocular tuberculosis was relatively frequent, careful examination usually showed a tuberculous focus elsewhere, such usually being entirely quiescent, healed or calcified hilus glands.

Reviewing the literature on the subject the author finds reported out of approximately 20,000 cases of active pulmonary tuberculosis only about twenty-four cases of ocular tuberculosis, while careful examination of about 383 patients seen because of ocular tuberculosis, 208 revealed very slight changes on X-ray examination and fifty cases showed associated clinical findings, the majority of a very minor nature.

The author reports two cases occurring in young women with active pulmonary tuberculosis, in each case an iridochoroiditis which cleared up leaving a localized chorioretinal scar, very slight vitreous haze, and a complete restoration of vision. These two cases were the only ones seen in six years in an institution of 100 to 120 tuberculous inmates.

He concludes that tuberculous eye lesions are exceedingly uncommon in patients with phthisis and that while ocular tuberculosis is probably hematogenous and secondary to a focus elsewhere in the body, most often the tracheobronchial or hilus glands, the primary lesion is almost always slight, quiescent, healed or calcified.

M. F. Fellows, M.D.

INJURIES OF THE EAR FROM FRACTURE OF THE SKULL: E. D. Davis, London (Jour. of Laryng. and Otol., Vol. XLVI, No. 8, August, 1931). The author emphasizes the importance of immediate aural examination in cases of skull fracture, many of which involve the ear mechanism.

Cases involving the labyrinth are almost invariably fatal. Those involving the middle ear or external canal frequently recover. Hemorrhage from the canal is an unfavorable sign. If from both sides, the mortality is 66 per cent. Bleeding on one side alone shows a 39 per cent mortality. Some cases show hemorrhage into the middle ear without rupture of the drum membrane, which then appears bluish. Prolonged or copious bleeding from the canal means injury to the lateral sinus or middle meningeal artery and demands prompt surgical intervention.

Ear canals must not be plugged. Irrigation and "drops" are absolutely forbidden. If suppuration of the ear pre-existed, or develops later, the prognosis is much more unfavorable. Free drainage must then be provided at all costs (paracentesis), mastoidectomy if indicated. Recovered cases rarely suffer much hearing loss; when this does occur, it is of the middle ear (obstructive type). Immediate loss of hearing is common, but usually returns in three or four weeks. Seventh nerve paralysis is common but almost always recovers in weeks or months. Facial tics may be permanent. Tinnitis and dizziness may also be more or less troublesome over long periods.

Treatment means long periods of absolute rest in bed. No packing, no irrigation. Immediate establishment of free drainage should suppuration intervene, as only by this means can meningitis be forestalled.

M. W. Wheeler, M.D.

ENDOGENOUS PANOPTHALMITIS ACCOMPANYING TONSILLITIS: F. Flandreau Van Fleet, M.D., New York (Arch. of Ophthal., Vol. 6, September, 1931, No. 3). A short review of the literature indicates that the most common causative factor is puerperal sepsis although cases have been reported accompanying cholecystitis, prostatitis, pneumonia, measles, mumps, articular tuberculosis and influenza. No case has been reported due to metastasis from the tonsils. Bacteriologically the most common etiologic factors are the staphylococcus, streptococcus, pneumococcus and meningococcus.

The author then reports a case of a child, aged two, who had been suffering from tonsillitis for three days. On the second day she had pain in her right eye. The lids were edematous and tense; the cornea was hazy; the pupil was contracted and the conjunctiva was inflamed, although there was not much discharge. The general and local condition became much worse under routine treatment. Examination of the nose failed to show any involvement of the sinuses. X-ray of the sinuses showed moderate ethmoid involvement, especially on the left. Evisceration was done two days later, after which the patient made an uneventful recovery.

Culture from the conjunctival sac showed a profuse growth of Staphylococcus albus and short-chain nonhemolytic Streptococcus mitis. Culture from the tonsils showed a profuse growth of Staphylococcus albus and short-chain hemolytic Streptococcus pyogenes. At the time of operation, culture from the interior of the globe showed the same bacteriology as the tonsils.

Lucian G. Culver, M.D.

THE EFFECT OF TONSILLECTOMY IN ALLERGIC CONDITIONS: S. S. Bullen, Rochester, N. Y. (Jour. Allergy, July, 1931, Vol. 2, No. 5, p. 310). A study was made of the records of 600 patients with symptoms of allergic conditions in the upper or lower respiratory tracts. These cases had been followed for at least one year and many for ten years by personal observation or letter.

Patients with obvious gross infections such as chronic sinusitis, chronic bronchitis, bronchiectasis, etc., are excluded. On 300 patients tonsillectomies had been done—the remaining 300 served as controls. Seventy-nine and six-tenths had positive skin reactions by the scratch test. The treatment consisted in the removal of offending substances from contact with the patient whenever possible, as in the case of foods to which they were hypersensitive, animal emanations as in feather pillows, and so forth. Patients reacting to pollens were treated with pollen extracts.

The results of treatment are tabulated as follows:

OPERATED GROUP—PER CENT

Good	Fair	Poor	Failure
32.6	33.4	12.4	15.6
66			(6 refused treatment)

UNOPERATED GROUP—PER CENT

Good	Fair	Poor	Failure
31.7	37.7	12.0	16.6
69.4			(2 refused treatment)

The incidence of allergic manifestations in a ten year follow-up group of 2,000 children (Dr. Albert D. Kaiser's records) was as follows:

1,000 children (tonsillectomy)	1,000 children (controls)
41	Allergic coryza or asthma

Lawrence R. Boies, M.D.

THE SYMPTOM OF VERTIGO: W. E. Grove, Milwaukee (Arch. of Otolaryngology, August, 1931, Vol. 14, No. 2, p. 177). Turning vertigo is nearly always a sign of disturbed vestibular function; tactile vertigo may also at times be of vestibular origin. From an examination of approximately 300 patients suffering from injuries to the head, the author states positively that true turning vertigo accompanied by spontaneous nystagmus is present in a fairly considerable number of cases in which the most thorough and exacting examination of the peripheral vascular system revealed it to be functioning in a normal manner. It is the author's contention that in these persons the vertigo is caused by damage to the central vestibular area situated beneath the floor of the fourth ventricle.

If the patient exhibits true turning vertigo he must have or must at some time have had spontaneous vestibular nystagmus. This may not be present on every examination. It may be elicited by the head movement tests of Brunner.

The vertigo of a labyrinthitis or due to exclusion of a labyrinth by transverse fracture of a pyramid is violent and continuous. It improves after a few days and disappears entirely after a lapse of 5 or 6 weeks, because after this length of time the other labyrinth has learned to compensate for the loss of its mate.

The vertigo of a vasomotor disturbance in the central vestibular area is not continuous, nor is it so severe as to be completely disabling. It comes on in short spells of a few minutes duration brought on by such factors as rolling and turning in bed, looking up suddenly, bending the head forward suddenly, going above ground level, undue exposure to sunlight, mental and physical exertion, and even the slightest use of alcohol in any form.

The duration of the vertigo may assist one to some extent in making a diagnosis. In general, it may be said that if the vertigo lasts only a short time and then vanishes completely, it is more probably being caused by some acute condition of the labyrinth or vestibular nerve than a lesion in the brain stem. On the other hand, if the vertigo lasts longer and comes on in attacks over a period of years, it is more apt to be due to some lesion of the central nervous system although a chronic disease of the labyrinth cannot be excluded.

Lawrence R. Boies, M.D.

THE PATHOGENESIS OF OTOSCLEROSIS: K. Wittmaack, Hamburg, Germany (Arch. of Otolaryngology, August, 1931, Vol. 14, No. 2, p. 186). Wittmaack outlines the basis for his contention that venous stasis is an etiological agent in the production of otosclerosis. His investigations are in part supported by the Research Fund of the American Otological Society.

The author points out the generally accepted fact that the bony labyrinth normally differs from all other bones of the skeleton. It is formed on a cartilaginous capsule by endochondral ossification which starts from so-called points of ossification, in contradistinction to other endochondral bones. The labyrinthine capsule attains its final structure and size early in life and normally does not undergo further transformation. Consequently, the distribution of blood vessels, which is determined by points of ossification, also remains practically unchanged. These structural peculiarities are also found in some other mammals than man, and in certain non-mammals. In animals, however, spontaneous disease of the labyrinthine capsule similar to otosclerosis has not yet been observed. The author has, however, been able to reproduce repeatedly lesions in the hen which are essentially identical with the pathological processes seen microscopically in human otosclerosis.

The experimental production of venous stasis is accomplished by introducing ferric chloride into the intracranial median sinus. In 80 per cent of the cases positive results were obtained. Photomicrographs are reproduced comparing the experimental picture in the hen with the picture of human otosclerosis. The similarity is striking.

Lawrence R. Boies, M.D.

MEDICINE

TUBERCULOSIS ABSTRACTS*

As the mariner trims his sails to the weather, so the physician adjusts his therapeutic measures according to the pathological course of the disease. While general principles must guide us in the treatment of tuberculosis, no formula applicable to every case can be devised. If one understands the sequence of events following infection by bacillus tuberculosis, the response of the tissues and the natural processes of healing, treatment becomes more rational and adaptable to the immediate need. The most we can do in our present state of knowledge is to support the natural tendencies of the body to overcome the disease. M. Jaquerod of Leysin, Switzerland, discusses the natural processes of healing in pulmonary tuberculosis in *Tubercle,* of July, 1931. Abstracts of the article follow.

---

*Reprinted from Tuberculosis Abstracts, a review for physicians issued monthly by the National Tuberculosis Association, November, 1931, Vol. IV, Number 11.

Healing Processes in Tuberculosis

Radiography enables us to demonstrate the anatomical changes taking place in tuberculosis during life and ending in cure with a precision which is almost equivalent to post-mortem findings. Pulmonary tuberculosis was formerly considered as a chronic ailment from the very beginning. We now know that the disease passes through various stages before it arrives at a condition of chronicity. Virchow taught that all pulmonary tuberculosis lesions necessarily originated from miliary tubercles, solitary or conglomerate, and that these were the only specific lesions produced by the tubercle bacillus. Congestive or simple inflammatory changes in the region of chronic foci had been observed, but these changes were regarded merely as neighboring reactions without clinical significance. Today, we know that these lesions *are* tuberculosis, that they preceded the chronic lesions, and that during a period of a year or more they may exist alone and constitute the whole of the disease.

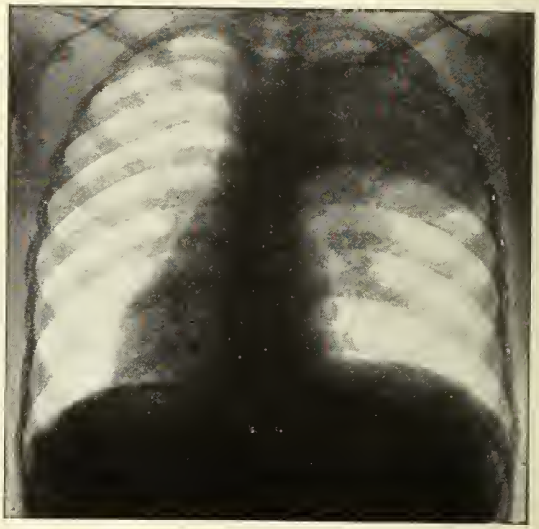
INFLAMMATORY NATURE OF TUBERCULOSIS

Wilson-Fox and Green, two English pathologists, recognized the pneumonic nature of the lesions (in 1873-74) before the tubercle bacillus had been discovered. Thaon, in France (1885), found that the tubercle bacillus was really the sole cause of tuberculous pneumonic lesions. Only ten years ago, the distinction between miliary (productive) and inflammatory (exudative) lesions was recognized in Germany.

This conception of the pneumonic or inflammatory nature of tuberculous lesions at their origin is of practical importance. As long as the lesions are in the inflammatory stage, they may heal by resolution comparable in every way to the resolution of the lesions in acute pneumonia, except that the process of regression lasts several months instead of one or two weeks. In the pneumonic stage, the bacilli are not yet solidly implanted in the tissues as in miliary type lesions but are still on the surface of the mucous membrane between the epithelial cells in the alveoli and the intercellular spaces. Consequently, their destruction and elimination by phagocytes or other means is rendered much easier. Only when these lesions do not heal do the manifold lesions of chronic tuberculosis develop, and these heal with greater difficulty. Indeed, when that has occurred, healing is possible only by the complicated processes of fibrosis and pulmonary retraction.

TIME ELEMENT IMPORTANT

The question, "How recent is the disease?" (that is to say, the lesion) has acquired a high clinical importance from the standpoint of prognosis and treatment. In recent pulmonary lesions, two types must be distinguished. The first type is encountered chiefly in childhood in an individual not previously infected and, therefore, non-allergic. If in this case the infection is slight, tuberculin sensitiveness will be produced but no actual disease capable of giving rise to clinical symptoms of obvious anatomical lesions. This the author calls abortive tuberculosis. But if the infection is more serious, actual disease may occur. The lesion is of relatively slight importance and it consists usually of an infiltration in the neighborhood of the point of inoculation with swelling of the lymph nodes at the hilum. These lesions are recognized by radiography. (In the United States, this type is designated as the childhood type of tuberculosis.) They regress slowly and heal by resolution, leaving no trace other than calcification in the hilum glands (tracheobronchial nodes). When the infection is too massive or if the resistance is not sufficiently good, the disease may continue to develop past the non-allergic phase and the lesions may soften or generalize.



X-ray plate, chest of boy, aged 8. Consolidation of right upper lobe with marked enlargement of lymph nodes from fourth to eighth posterior ribs. Physical signs: left, normal; right, limited expansion, dullness, bronchial breathing, and rales. Tuberculin test positive. Temperature up to 100.4° during dispensary observation. Twelve per cent underweight. Cough marked, sputum positive in April to animal inoculation; in May, to routine examination.

Twenty months later, the upper lobe had contracted somewhat and was less opaque; fresh infiltration had appeared in the middle lobe; the lymph nodes had diminished slightly and were beginning to calcify. In ten months more, both the upper and middle lobes cleared considerably and the outlook is now hopeful.

(From "Childhood Type of Tuberculosis," Chadwick and McPhedran, Nat. Tuberc. Assn.)

When bacillary infection takes place in an individual already sensitized by tubercle bacilli (reinfection), the pulmonary reactions may be much more intense, while the reaction of the pulmonary lymph nodes is almost nil. (In the United States, this form is called adult type of tuberculosis.) The inflammatory reaction may go so far as necrosis of parts of the lung, ending in cavity formation. But this cavity is quite different from that of chronic tuberculosis. Its walls are not formed by a well organized pyogenic membrane but by simple inflammatory tissue; and for that reason may heal by resolution without leaving any apparent fibrous scar. The cavity is, therefore, not always the final and most serious lesion of pulmonary tuberculosis.

The early forms of tuberculosis described are capable of cure by resolution; the chronic form only by the complicated processes of fibrous transformation and natural or artificial organic modification.

PNEUMOTHORAX FAVORED

The author is of the opinion that pneumothorax treatment is indicated in almost all cases of pulmonary tuberculosis as soon as diagnosed. Others consider that they are justified in waiting a certain time while placing the patient in the best possible condition for the cicatrization of his lesions. In favor of intervention, the author mentions the physician's preference for a method which enables him to play an active part and at the same time to verify speedily the results of his intervention.

He also feels that, as the first two or early forms always exist before the third, it is in these early stages that the bacillus can be most easily attacked, and, therefore, the possibilities of finding a remedy, of checking and curing pulmonary tuberculosis, are most promising if directed to the early types. He thinks, therefore, that the search for a cure should be directed to some remedy capable of facilitating the process of resolution. —*The Natural Processes of Healing in Pulmonary Tuberculosis, M. Jaquerod, Tubercle, July, 1931.*

THERAPEUTIC RESEARCH

The ideal of therapy is, of course, a practicable bactericide. Meanwhile, as we await this, it would appear that a study of structure would suggest the following paths as worthy of exploration:

1. That directed toward the discovery of a medium or method to accelerate and heighten cellular proliferation and fibrosis. Dangers lie in enhancing the tendency of tissues to tumor-formation.
2. That toward a medium to neutralize the intoxicating products of the allergic reaction. If it were non-specific, it might prove a veritable boon in many infectious diseases.
3. That toward a medium to neutralize the poisonous products that proceed from tuberculous foci. For reasons frequently expressed, it is believed that these are not specific, but are substances that result from the death and disintegration of the cellular components of foci. Can a substance antagonistic to them be found? Or a substance that would so act upon the body as to ward off their physiological effects?—*The Evolution of Tubercle, Allen K. Krause.*

LEUKOCYTIC REACTION IN TUBERCULOSIS OF INFANTS AND CHILDREN: Carl H. Smith (Amer. Jour. of Med. Sci., August, 1931).

The important white blood count is best demonstrated by the newer technic. It reflects the pathological status of the tuberculous lesion.

Sabin comments as follows: The major effect of tuberculosis is on the monocyte. The bacillus grows within the monocyte. The lymphocyte is concerned with limitation of the spread. This reaction may be measured by the preponderance of the lymphocyte. The activity is indicated by increased monocytic count. Reversal of the normal relationship indicates activity or extension. When arrest takes place, lymphocytes are increased. Medlar emphasizes the fact that the polymorph-neutrophile indicates tuberculous abscess formation. The supra-vital technic of Sabin allows of examination of cells in the living state, thus allowing more accurate cell differentiation.

STUDY

The monocyte (identical with the transitional cell of Ehrlich, including also what is known as the large monocyte) has an eccentric nucleus and is distinguished by a rosette about the centrosphere. The monocyte loses its motility when it becomes the host of the bacillus, and is stimulated or modified. Result: development of the epitheloid and later the giant cell of Langhans. These changes may be seen in supra-vital films.

The study included 291 supra-vital counts. Ninety-three cases were infants and children. Fifty were of the normal group. (*See* tabulated results.) The results would indicate, (1) that increase of the neutrophiles and monocytes is related in an important way to extension and activity; (2) that lymphocyte increase is associated with resistance; (3) that normal children have a high lymphocyte count—lymphocyte comparisons must be made with the normal; (4) that the monocyte-lymphocyte ratio increases with age from .09 to 1. In acute tuberculosis there were seventeen cases; fourteen of these were meningitis from five to six years.

RESULTS

(1) The total white blood count was elevated.

(2) Neutrophilic leukocytes and monocytes were increased.

(3) Lymphocytes were decreased.

(4) Stimulated or modified monocytes were frequent.

Epitheloid cells were less frequent. In the sub-acute and chronic form there were ten cases. Three patients had pleurisy, two epituberculosis. Five had extra-pulmonary forms. These, especially the extra pulmonary forms, had low monocyte-leukocyte ratios.

In latent forms of tuberculosis with a positive reaction to low tuberculin dilutions, eosinophiles were above normal in one-half the cases.

Rich remarks that allergy and resistance cannot be used interchangeably.

Sabin notes that the monocytes and their derivatives are hosts of the tubercle bacillus and are related to dissemination. Epitheloid cells are found in Hodgkin's disease. Regression and progression are reflected in the peripheral blood picture.

CONCLUSIONS

(1) The blood picture of a tuberculous infant may be co-related with the activity of the pathologic lesion.

(2) The complete index of activity is as follows:
    (a) Increase in white cell count.
    (b) Elevation in p.m.n. and monocytes.
    (c) Drop in eosinophiles and lymphocytes.
    (d) Rising monocyte-leukocyte ratio.
    (e) Reversion to former type in healing.

(3) The trend is ascertained by numerical comparison, emphasis on the monocyte-leukocyte ratio.

(4) This examination often furnishes the earlier signs of change in the status of the disease in childhood.

J. G. Lamont, M.D.

URINARY ACIDITY IN TUBERCULOSIS: K. L. McCluskey, Chicago Municipal San. (Amer. Rev. of Tuberc., August, 1931, XXIV, p. 182). *Pathological conditions* resulting in acidosis are: Diabetes mellitus, uremia, nephritis, rheumatism and heart diseases.

Normal metabolism produces acids which are removed by the lungs (carbonic acid), kidneys (mineral and organic acids), and skin. Excessive tissue destruction and metabolism of the tubercle bacillus itself throw greater demand upon the governors or regulators of body-neutrality. Disturbances may be expected to appear first in the urinary secretion.

Acidosis results from *over-production* or *retention* of acids. Acid waste is neutralized by blood alkalies. The kidney returns part of the alkali to the blood and excretes the rest as salts. If the acid products are not neutralized by blood alkalies, the urinary picture is that of decreased pH, increased titratable acidity and decreased normal dibasic phosphate and ammonia. The kidney is thus called upon to excrete a urine of higher acid intensity. The result is frequent, slight albuminuria. In acidosis, with neutralization by blood alkalies, there is lack of alkali conservation. The urine shows increased pH and a lower titratable acidity with an increase of dibasic phosphate.

The study included eighteen subjects:

Group I—6 patients working 3 to 5 hours daily.
Group II—3 patients, confined to bed.
Group III—6 patients, critically ill.
Group IV—3 normal subjects.

All of the urines were free from sugar and albumin, except two minor albuminurics who were critically ill.

Urine was collected for a day-period and a night-period, 8 to 8, and these were analyzed separately, for: (1) ammonia, (2) titratable-acidity, (3) pH, (4) creatin, (5) creatinin, (6) organic acids.

CONCLUSIONS

1. The pH value of the first two groups was identical with the normal group for the day-period.
2. The pH value of the night-period for group I is below that of normal group, and group II is still lower.
3. The creatinin co-efficient is lowered with the severity of the disease. There is greater creatinin secretion at night.
4. Creatinin values are variable.
5. Critically ill patients had an increase in ammonia; conclusion, overwithdrawal of fixed alkalies.
6. The amount of titratable acidity is greater at night than at day.
7. Total inorganic acids fall consistently from group I through group III.
8. Total organic acids are lower than normal except the critically ill, who show an increase over group II.
9. The quantity of inorganic acid slightly exceeds the organic acid.
10. Tuberculosis causes a mild but not a pronounced degree of acidosis. Blood alkali is conserved first and later depleted in the advanced stages.
11. A pre-eminently base-forming diet would assist the body in overcoming the acidosis.

John G. Lamont, M.D.

PEDIATRICS

STUDIES IN SCARLET FEVER VI—COMBINED ACTIVE AND PASSIVE IMMUNIZATION TO SCARLET FEVER: A. Lichtenstein (Acta Paediatr. X:4:539, June, 1931). From the Epidemic Hospital at Stockholm, Lichtenstein reports the results of attempts to secure immunity to Scarlet Fever by a combined method of serum and vaccine treatment. The 82 persons chosen for the experiment had all been directly exposed to the disease and showed positive Dick reactions. The adults were given either 20 c.c. of scarlatinal streptococcic serum or 50 c.c. of convalescent's serum—children, one-half the dose. Immediately, and within a week's time, each was also vaccinated with toxin plus bacteria. The vaccine was injected at intervals of three to seven days for five doses, adults receiving respectively 100 million, 500 million, 1 billion, 2 billion and 5 billion streptococci and 30, 150, 300, 600 and 1,500 skin test doses. Children under five years were given 100, 300, 500 and 700 million and 1 billion streptococci respectively, combined with 30, 90, 150, 210 and 300 skin test doses. The patients experienced no discomfort subsequently. In twenty-seven of forty adults and in thirty-seven of forty-two children, the Dick test turned to negative following the serum injection. All were found Dick-negative after vaccination. In none of the three groups thus treated was there any further scarlet fever for the next few months. One of the children contracted the disease five months later, and, upon testing, six out of twenty children were found to have positive Dick reactions at the end of six months, though weaker than previously.

The author is conservative in drawing his conclusions, but believes that the results are encouraging enough for further investigation, and suggests that increased doses of vaccine might prolong the period of immunity.

L. G. Frary, M.D.

STUDIES IN SCARLET FEVER. VII: TREATMENT WITH STREPTOCOCCUS ANTITOXIC SERUM: A. Lichtenstein (Acta Paediatr. X:5:549-575, June, 1931). Scarlatinal streptococcus antitoxic serum was first used at the Epidemic Hospital of Stockholm in 1925, and the author was so impressed with its value that it has been used in all serious cases since that time, unless there was some contra-indication. He now reports data from the years 1926-1929 inclusive, during which time, 2,104 cases of scarlet fever were admitted, of which 512 were given antitoxic serum.

He regrets the lack of a control group but did not feel justified in choosing only alternate cases because of the efficacy of the treatment. Children were given an intravenous dose of 10 c.c. immediately; adults, 10 or 20 c.c., depending on the severity of symptoms. The dose was repeated on the next day if there was no definite result, unless complication developed. In a small group, serum was injected intramuscularly.

It was early discovered that results were entirely different in complicated and uncomplicated cases. Where there was no complication, there was regularly noted a critical fall of temperature immediately after the injection, to about 37° C., with a corresponding rapid improvement of all symptoms. In 280 out of 350 patients, the result was of this type, *i.e.,* "complete"; in fifty-seven, there was a critical fall to about 38° C. and a decided improvement, *i.e.,* "good"; in thirteen, results were negative. In a series treated with convalescent serum, results were less favorable, 219 being "complete," ninety-two "good" and thirty-nine negative. For reasons given later, serum should be given early, although it was found to be effective as long as toxic symptoms were present, even into the second week.

Serum treatment was ineffective against already existing complications—in fact the author believes that failure to secure an immediate complete serum effect is evidence of presence of a complication, and should indicate a thorough search for such a complication. Improvement in the general toxic condition of the patient even in the face of complication, however, seems to occur, so that he favors giving serum. Early serum treatment may reduce the frequency of complications, but, after the third day, such is probably not the case. There were no deaths in cases treated before the onset of complications, nor among those which were so mild from the start that serum was not considered necessary. In three of the eight deaths occurring in the series given sera, scarlet fever was only a contributory cause of death; in the other five, the powerlessness of sera against existing complications was clearly demonstrated.

There was little serum sickness, and few bad effects resulted from treatment, all of which were easily controlled. The author suggests that the unfavorable effects reported in America may be due to the use of a more concentrated serum than that made in Sweden. Throughout this study, Swedish serum was used. As to effect on mortality, the author prefers to draw no definite conclusions, since there has been a general decrease in the severity of the disease in Sweden, and since he had no control group. He believes the real test will come when a severe epidemic occurs.

L. G. Frary, M.D.

VIOSTEROL AND COD LIVER OIL! E. O. Prather, Jr., M.S., Instructor in Pharmacology, University of Tennessee; Martha Nelson, M.S., Asst. in Research, Edward Clay Michell Clinic; and A. Richard Bliss, Jr., M.D., Chief, Division of Pharmacology, Memphis, Tenn. (Amer. Jour. of Diseases of Children, July, 1931, Volume 42, Number 1).

Because of the vagueness and the indirectness of some manufacturers' statements concerning viosterol, there is a growing belief among pediatricians and physicians in general that viosterol is a concentrated substitute for cod liver oil, and the substance is enjoying an increasing popularity as a "substitute for cod liver oil."

Although aware of the fact that cod liver oil contains two vitamins and viosterol only one, the average physician is better acquainted with the antirachitic vitamin, and is likely to disregard the importance of fat-soluble vitamin A and its influence on the child's resistance to infections.

When animals are fed a purified diet adequate in proteins, inorganic salts, calorics and vitamin B, they grow well for a short time; then the weight becomes stationary or decreases rapidly, and xerophthalmia develops. The upper respiratory tract becomes inflamed; the liver and spleen become discolored, shrunken and infiltrated with fat; the kidneys become sand-colored, and the intestines are found to be thin-walled and filled with gas. In some cases, the stomach, as well as the entire intestinal tract, is badly distended. No visible intraperitoneal fat is present. The intestines vary in color from dull brown to a degree of inflammation that is almost red. The amount of calcium deposited in the bones is very small.

The addition of viosterol to a diet like the aforementioned one increases the calcification of the bones, but it does not prevent or cure the xerophthalmia or increase the growth of the animal. The addition of cod liver oil to the aforementioned diet results in excellent growth of the animals, a better calcification of the bones, an increased deposition of body fat and normal respiratory tracts, and the liver, kidneys, spleen and intestines are found to be normal.

Viosterol, therefore, does not demonstrate the power to stimulate growth and development of the body and vital organs, or to prevent infections of the upper respiratory tract or to produce the same degree of calcification and growth of the bones as does cod liver oil.

Since "colds," malnutrition and intestinal inadequacies are more frequent in children than rickets, this study emphatically suggests that the apparently widespread substitution of viosterol for cod liver oil in the diet of the child is not logical and may result in an appreciable decrease of the child's strength and resistance to infections.

R. N. Andrews, M.D.

HIRSCHSPRUNG'S DISEASE TREATED BY LUMBAR SYMPATHECTOMY: T. Wood Clarke, M.D., and Frederick M. Miller, M.D., F.A.C.S., Utica, N. Y. (Arch. of Ped., September, 1931, Vol. XLVIII, No. 9). Congenital idiopathic dilatation of the colon, megacolon, giant colon, or Hirschsprung's disease, is a congenital malformation characterized by dilatation of the colon, abdominal distention, obstipation, at times alternating with diarrhea, emaciation, and general weakness.

The surgical treatment, until recently, has consisted of colostomy with artificial anus, or of colectomy. The most recent surgical suggestion is lumbar sympathectomy.

In 1924, N. D. Royle, the orthopedic surgeon, and John I. Hunter, Professor of Anatomy of Sydney, Australia, working together, proved experimentally that resection of the sympathetic ganglia relieved the spasticity of the extremities in animals in which artificial spastic paralysis had been produced. Hunter further showed that in paralyzed animals in which the distal portion of the colon was quiescent and dilated, excision of the lumbar ganglia caused immediate resumption of activity of the distal colon and expulsion of feces.

In 1929 and 1930, Learmouth and Markowitz of the Mayo Clinic, by animal experimentation, confirmed the researches of Langley and Anderson, and of Hunter. Among their conclusions are that section of the lumbar colonic nerve invariably leads to an immediate increase in intracolonic pressure and in the amplitude of the contraction of the colon, and that the internal sphincter derives a certain amount of motor innervation through the lumbar sympathetic outflow.

Merle, Scott and Morton add a contribution by demonstrating in two cases of Hirschsprung's disease that spinal anesthesia temporarily terminated the motor inertia of the large bowel and caused copious bowel movements.

The results of the operation of lumbar sympathectomy, in the small number of cases in which it has been performed, have been uniformly favorable. The patients have shown remarkable improvement in their general health. The abdominal distention has decreased with variable rapidity, and the patients, who previously had suffered from obstipation, report regular bowel movements once or twice a day, usually without the aid of laxatives or enemata. There have been no deaths reported from the operation. No untoward symptoms in reference to other pelvic organs have occurred.

R. N. Andrews, M.D.

FEBRIPHOBIA: Charles Herrman, M.D., New York (Archives of Ped., September, 1931, Vol. XLVIII, No. 9). There are three manifestations in children which cause great anxiety to the parents and often take the physician out of his comfortable bed at night—convulsions, severe hemorrhages and high temperatures. The significance of high temperature depends on its cause. In some cases it may represent a favorable reaction. The febrile reaction seems to represent an attempt on the part of the organism to counteract the injurious effect of the entrance of foreign material, an increased effort to fight the disease by stimulating the circulatory, respiratory and endocrine systems. As is well known, the good effect of baths, douches and packs is not due solely to the reduction of temperature, for this is often slight, but also to the favorable effect on the nervous system.

The fact that a given procedure results in a reduction of the temperature is not in itself proof that the patient is benefited and the disease controlled. Antipyretic drugs, aside from their depressing effect on the heart, may interfere with the rapid development of antibodies.

Apparently a high temperature, like a high polymorphonuclear leukocyte count, indicates a severe infection, but such patients may also have a good resistance. It is important to know whether, in addition to the high temperature, the patient presents other serious manifestations, such as a poor circulation and disturbances of the nervous system. If the child has an appetite and requests food there is no reason why at least carbohydrates and fruit juices should not be given. Fluids in sufficient quantity are absolutely essential and should be insisted on to prevent dehydration, to increase elimination and the removal of ketone bodies.

The anxiety produced by a marked rise in temperature in children, when unaccompanied by other serious manifestations, is out of all proportion to the danger.

R. N. Andrews, M.D.

ABDOMINAL PAIN IN CHILDREN WITH UPPER RESPIRATORY INFECTIONS: Ralph R. Scobey, M.D., Syracuse, N. Y. (Arch. of Ped., September, 1931, Vol. XLVIII, No. 9). Abdominal pain in children, resulting from infections of the upper respiratory tract, occurs more frequently than is generally supposed.

Brennemann, in 1921, and again in 1927, called attention to the incidence of this condition in connection with throat infections. The pain was usually in the region of the umbilicus. Brennemann felt that the cause of the abdominal pain was due to mesenteric or retroperitoneal lymphadenitis. His conclusions were prompted by the fact that it was usually present during the acute infection and often outlasted it. Enlarged abdominal lymph nodes were often observed in cases of this kind, which were operated. He also called attention to similar adenopathy found at autopsy in cases of influenza.

The fact must always be borne in mind that a pathological appendix can co-exist, or be secondary to an upper respiratory infection. Attention has been called by many writers to the fact that cases of appendicitis may occur in greatly increased numbers during epidemics of grippal infections.

Another condition, which has received little attention in the literature as a cause of abdominal pain, is "irritable colon." MacDonald calls attention to this condition associated with acute upper respiratory infections. There is still another condition which is responsible for abdominal pain and which may manifest itself during an acute upper respiratory infection, namely, pyelitis.

While it has been shown that abdominal pain may result from infections of the upper respiratory tract, one must not lose sight of the fact that serious abdominal pathology may exist and be entirely independent. It must be remembered, also, that appendicitis is one of the commonest causes of abdominal pain and may present itself much more frequently during epidemics of upper respiratory infections.

R. N. Andrews, M.D.

ROENTGENOLOGY

OBSTRUCTIVE LESIONS OF THE SMALL BOWEL: C. H. Heacock (*Radiology,* July, 1931, XVII, 119-124). Cases of intestinal obstruction fall into one of the following groups: (1) Those in which a clear-cut, definite clinical diagnosis can be made and in which the findings localize the site of the obstruction, (2) those in which the clinical diagnosis is definite but in which there are no localizing symptoms or findings, (3) those in which the diagnosis is uncertain, and (4) those in which the diagnosis is not even suspected by the clinician.

Whenever there is any doubt about the presence or location of an obstruction, *i.e.,* in the last three groups, there is an indication for a roentgenologic examination. The extent of the examination and the amount of work required will depend largely upon how acute and how complete is the obstruction.

If the roentgen examination is to be of much benefit in the acute cases, it is of utmost importance that the examination be completed quickly and with minimal tax upon the strength of the patient. These acute obstructions usually develop soon after an operation. It is important to make this examination in both the supine and erect positions, and with the motor-driven table both fluoroscopic and radiographic studies can be made without any exertion on the part of the patient. If the patient cannot be removed from his bed, roentgenograms can be made in two planes without moving him and a great deal of information obtained.

While small amounts of gas may exist normally in the small bowel, the only collections of gas seen on the radiographs of normal individuals occur in the stomach and colon. Collections of gas in the small bowel are, therefore, always significant, and, when the additional signs of distention and fluid levels are present, definite criteria for the diagnosis of obstruction may be said to exist. The fluid may be easily overlooked unless the patient is examined in two planes, preferably the supine and the erect postures.

Usually the appearance and distribution of the gas enable the roentgenologist to determine its location. In the small bowel haustral markings are absent, while the valvulæ conniventes stand out prominently.

In chronic or partial obstruction there may be no distended loops of small bowel and no information obtained on what Davis calls the "scout film." In this type of case the administration of barium is necessary to make the diagnosis. It is also in this type of case that the diagnosis is most often doubtful and the need for immediate interference not so urgent. Within this group fall the neoplasms—both benign and malignant—and it must be remembered that the early detection and localization of the latter lesions determine the success of the treatment. The examination with the ingested meal, which may require forty-eight hours, is permissible. Thus far no untoward effects have been observed.

There are two reliable roentgen signs of partial obstruction. One is dilatation of the lumen proximal to the obstruction and the other is a disturbance in motility. The slowing up and damming back of the current is manifest throughout the small intestine, and there may even be a gastric retention. The delay becomes progressively more pronounced until the point of obstruction is reached. After passing this point the normal progress of the meal is resumed. It is important for the roentgenologist to know the normal motility for the opaque mixture he is employing. This will vary somewhat, depending upon how much fat and carbohydrate are added to the barium. Delayed motility due to obstruction must not be confused with stasis in the small bowel without mechanical obstruction. Stasis usually occurs in the ileum and may be associated with no organic lesion. Lesions in the colon, especially the right half of the colon, must be ruled out and the possibility of a regurgitation through the ileocecal valve must be considered. The finding of barium at the twenty-four-hour observation is always significant and, in the absence of a lesion in the colon, generally means an obstructive lesion in the terminal ileum. While there is delayed motility in both stasis and obstruction in the former, dilatation of the lumen does not occur.

John D. Camp, M.D.

ELABORATION OF CRITERIA UPON WHICH THE EARLY DIAGNOSIS OF ACUTE INTESTINAL OBSTRUCTION MAY BE MADE. WITH SPECIAL CONSIDERATION OF THE VALUE OF X-RAY EVIDENCE: Owen H. Wangensteen. (*Radiology,* July, 1931, XVII, 44-62). The present high mortality in acute intestinal obstruction is due in large measure to late diagnosis. Revision of the usual criteria upon which the diagnosis of bowel obstruction is made is urgently indicated. Obstipation, regurgitant vomiting, and general abdominal distention portend the beginning of the end of life for the unfortunate sufferer with bowel obstruction. These must cease to be occurrences awaited before the diagnosis is made.

Intermittent, crampy, colicky pain associated with nausea and vomiting but unattended by local physical findings suggests acute intestinal obstruction. The bowel below the point of obstruction is physiologically as well as anatomically normal and will expel an administered enema, with the return of gas and feces. Gaseous shadows in the small intestine demonstrate the presence of intestinal stasis. The "ladder pattern" of gaseous distention in the small intestine need not be awaited to make the diagnosis. The stethoscope serves to distinguish whether the stasis is mechanical or paralytic in character. When the diagnosis is made early the mortality of operation for acute intestinal obstruction will exhibit a like improvement to that long ago manifest in the surgery of most other acute abdominal catastrophes.

In simple obstruction to the continuity of the small intestine gas may be visualized in the small intestine usually within four or five hours after the onset of symptoms. When the obstruction is in the colon a variable time may elapse before gaseous distention of the small intestine becomes visible on the X-ray film. In strangulation obstructions gaseous shadows in the small intestine do not appear as early as in simple obstructions and this criterion is, therefore, not as reliable an index as in the latter type of bowel occlusion. In vascular occlusions of the mesenteric vessels, gaseous distention does not occur as early as in simple obstruction. In the inhibitive ileus of peritonitis, gaseous distention of the small intestine may be observed early. Gaseous distention of both colon and small intestine is almost invariably present. The presence of dense "bands" between the dilated intestinal loops suggests the presence of exudate between the intestinal coils.

The entity of functional spastic ileus which simulates mechanical obstruction in all clinical features may be identified by proper correlation of clinical and roentgen findings. The special uses of X-ray evidence of obstruction are enumerated for intestinal atresia, imperforate anus, and intussusception. In the latter condition the barium enema may frequently be employed to reduce the invagination.

John D. Camp, M.D.

THE ROENTGEN DIAGNOSIS OF AORTIC ANEURYSM: Harper G. Sichler (*Radiology*, August, 1931, No. 2, 304-316). Comparative clinical and autopsy statistics indicate that many cases of aortic aneurysm are not diagnosed during life. Sacculated aneurysms, while the most common, are not the only type of aortic aneurysm, and the roentgen diagnosis should not be made contingent on finding local sacculations. All cases of syphilitic aortitis with dilatation should be kept under observation until it has been determined by the progress of the lesion whether or not the aortitis is complicated by aneurysm formation. Squaring of the aortic arch is characteristic of syphilitic aortitis.

A study of seventy-seven cases of aortic aneurysm occurring during a five-year period demonstrated the percentage of occurrence to be 0.06 per cent, that the proportion of syphilitics with aortic aneurysm was 1.6 per cent, and that of the total number of aneurysms 97 per cent were of syphilitic origin. The roentgen examination discovers a large number of cases of aortic aneurysm (nearly 30 per cent of this series) which produce no clinical signs or symptoms of their presence.

John D. Camp, M.D.

THE OSSEOUS CHANGES IN HYPERPARATHYROIDISM ASSOCIATED WITH PARATHYROID TUMOR: A Roentgenologic Study: John D. Camp and Harold C. Ochsner (*Radiology*, July, 1931, XVII, 63-69).

The roentgenographic changes observed in the osseous system in two cases of hyperparathyroidism associated with tumor of the parathyroid glands are presented. The osseous changes in roentgenograms consists of generalized osteoporosis, cystic lesions, and deformities. The generalized osteoporosis is characterized by a miliary or granular appearance. This change is best observed in the skull and appears to be peculiar to hyperparathyroidism. In addition, the bone trabeculæ and cortical bone are thinned, and areas of subperiosteal absorption are seen in the long bones and phalanges. Single or multiple cystic lesions are found in the jaw, pelvic bones, and long bones. These lesions are often confounded with those of osteitis fibrosa and with giant-cell tumor. The deformities due to softening of the bones consist of kyphosis, narrowing of the pelvis, coxa vara, bowing of the legs, and infractions. It is not unlikely that pathologic fractures may even occur. In addition, renal calculi are not uncommonly found. In each instance, removal of a parathyroid tumor was followed by a definite arrest of decalcification and progress toward restoration of normal bone structure, as observed roentgenographically.

John D. Camp, M.D.

SURGERY

TREATMENT OF VARIOUS PERIPHERAL PAIN SYNDROMES BY SUBARACHNOID ALCOHOLIZATION OF POSTERIOR NERVE ROOTS, AT THEIR EMERGENCE FROM THE SPINAL CORD: A. M. Dogliotti, M.D., University of Turin, Italy, La Presse Medicale, Number 67, August 22, 1931.

The author reviews the various nerve tracts by which pain is carried from the periphery to the brain. In such conditions where the usual conservative treatment does not help, before resorting to the more serious surgical attacks, such as laminectomy, postero-radicotomy, and anterior lateral cordotomy (procedures which, besides being serious undertakings, are not always reliable for physical and anatomical reasons), he proposed, and has used, subarachnoid injections of absolute alcohol to block these nerves, and in this way relieve or cure painful conditions of various kinds. The substance used is absolute alcohol, which he has shown by in vitro laboratory test will rise to the surface of spinal fluid, and mix with it very slowly. Dosage and physiological effects have been studied in the dog, and later used in the human in a series of 45 cases.

The method consists in making the usual lumbar puncture at a pre-determined site in the median line between the spinous processes; for pain in the sacral plexus, the interval between the 5th lumbar and 1st sacral is used; for pain in the lumbar roots, the spaces between 3rd, 4th, and 5th lumbar are used; for the lateral femoral-cutaneous and ilio-inguinal regions, the injection is made between the 2nd and 4th lumbar vertebræ; for visceral abdominal and lower intercostal pains, the space between the 12th dorsal and 1st lumbar, or, better, between the 1st and 2nd lumbar vertebra, is used; for intercostal injection, the corresponding vertebral space is used; for pains in the upper extremities, the lower cervical spaces would be indicated were it not for the difficulty of the intervention of the cervical dorsal protrusion of the cord, so that, instead, the space between the 4th and 5th dorsal vertebræ is used, assisted by placing the patient in such elevation of the trunk as to locate the alcohol in the desired region of the cord.

The patient is put in the classical position for the spinal puncture, and then caused to lie down on that side which is opposite to the side of pain. The elevation of the pelvis or shoulders is modified from 10 to 30 degrees, depending upon the region which it is desired to treat, the lighter absolute alcohol flowing always to the top. A syringe which is graduated in 0.1 c.c., which is equivalent to the tuberculin syringe, is used. The injection is made very slowly, drop by drop, so as to avoid mixing the alcohol in the spinal fluid. Depending upon the gravity of the neuralgia, one injects from 0.2 to 0.8 c.c. of absolute alcohol. The patient at once has a sense of heat in the affected territory, followed in ten to fifteen minutes by a zone of hypersthesia and some points of total analgesia. The tendinous as well as cutaneous reflexes are lessened and often completely disappear, and there is a slight motor disturbance, which disappears completely in a few hours, occasionally within a few days.

The painful symptoms, however, disappear in ten to fifteen minutes. In order to prevent the fluid from affecting the motor roots, the patient, besides lying on his side, inclines somewhat into the prone position. The effect of the injection is to stop the pain or to lessen it, and cure is brought about either directly by cutting out the irritating peripheral stimuli, or by stepping down its transmission through areas in which pain sense is relayed to the brain.

The forty-five cases in which this method was used include: twenty-two cases of subacute sciatica, unrelieved by more conservative methods; nine cases of funiculitis with radicular symptoms, and osteo-articular alterations in the spinal column; three cases of neuralgia of the lateral cutaneous nerve; one case of intercostal neuralgia, due to herpes zoster; two cases of sacrococcygeal neuralgia; two cases of painful stump following amputation; two cases of tabetic girdle pains; and two cases of acute circumscribed pain, (1) the interior border of the foot, (2) of the testicle and anus.

There was amelioration or cure in most of these cases, with the observation that the more diffusely distributed the pain is the better the results are. It is wise, for this treatment, to have the patient in the clinic or hospital, where, if necessary, he can be kept under observation, sometimes in bed, for two or three days. The treatment can be repeated in ten to fifteen days, if the result is incomplete.

Besides the type of cases in which the author has used this treatment, such cases where radicotomy has been used would offer a suitable field for this treatment, such as cases with profound modification of muscular tone, as Little's disease or other painful contractures. The method proposed is considered superior to more peripheral treatment, such as paravertebral or peripheral injections; on the other hand, it is not as serious an undertaking as laminectomy, postero-radicotomy, or antero-lateral cordotomy.

Three illustrations accompany the article.

A. E. Sohmer, M.D.

CONSULTATION BUREAU

(Continued from page 1006)

between them cannot be determined in advance. The usual practice is to give subcutaneous injections at five to seven day intervals. The exact time and number depend on the local and general reaction. The local reaction is the important guide to treatment. As a general rule, this is never allowed to exceed the size of a fifty-cent piece and the next dose is made larger or smaller on the basis of the previous reaction. Co-seasonal treatment of small repeated doses is sometimes used. Treatment may even be of benefit late in the season. General reactions may be serious and should be avoided if possible. Perennial treatment is based on the assumption that specific doses of the pollen about once a month would give better results. Whether one or more pollens should be used is a matter of judgment.

The results of desensitization are on the whole satisfactory. Whether permanent effects are obtained is still doubtful. In a total of 410 patients with ragweed hay fever who were treated and appeared to have relief of symptoms for at least two years without further treatment, in the meantime, 6.3% were cured; of the remainder, 238, or more than half, were greatly improved, 73 were improved, and 73 were the same. The spontaneous disappearance of hypersensitiveness is well known. How often it occurs is still very difficult to decide. This subject is very large and it is impossible to give you any more than a bare outline of some of the more important features.

Reference: "Clinical Allergy, Asthma and Hay Fever, Francis M. Rackemann, M.D., MacMillan Company, 1931."

SILVER NITRATE AMPULES AND CAPSULES

The A. M. A. Chemical Laboratory undertook an investigation of silver nitrate capsules and ampules to determine whether the market supply was satisfactory. The Laboratory found that the various brands of silver nitrate ampules contained in both wax and glass ampules showed that the strength of the silver nitrate solution is generally somewhat greater than the amount claimed and that practically none of the silver is absorbed by the wax ampule. The quantity of solution found in the glass ampules complied with that claimed. On the other hand, in the wax ampules not only did the quantity of solution vary with each brand, but the products of the various firms differed markedly, ranging from 0.07 c.c. to as high as 0.26 c.c. The Laboratory points to the possible danger from fragments of glass which may form when the glass ampule is opened and which may reach the infant's eye when the silver solution is instilled. The Council on Pharmacy and Chemistry considered the report of the Laboratory and authorized its publication. In recommending endorsement and publication of the report the Council's referee expressed gratification at the reassurance given by the report that the wax capsules do not inactivate the silver nitrate and called attention to the fact that the use of glass ampules may be an open invitation to accident. (Jour. A. M. A., September 5, 1931, p. 706.)

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Bulletin of the National Research Council. Number 83. A compendium of the statute law of coroners and medical examiners in the United States. George H. Weinmann. 240 pages. Price, paper cover, $3.00. Washington, D. C.; National Research Council, 1931.

Simplified Diabetic Management. Joseph T. Beardwood, Jr., A.B., M.D., F.A.C.P., and Herbert T. Kelly, M.D., A.A.C.P., both from Diabetic Clinic of Presbyterian Hospital in Philadelphia, etc. 190 pages. Price, cloth, $1.50. Philadelphia: J. B. Lippincott Company, 1931.

Medical Jurisprudence. Alfred W. Herzog, Ph.B., A.M., M.D., Honorary Academician of the International Academy of Letters and Sciences, Editor of The Medico-Legal Journal. 1051 pages. Price, $15.00. Indianapolis: The Bobbs-Merrill Company, 1931.

Surgical Pathology of the Skin, Fascia, Muscles, Tendons, Blood and Lymph Vessels. Arthur E. Hertzler, M.D. Surgeon to the Agnes Hertzler Memorial Hospital, Halstead, Kansas, Professor of Surgery, University of Kansas. 301 pages. Price, $5.00. Philadelphia: J. B. Lippincott Company, 1931.

INTESTINAL TOXEMIA (AUTOINTOXICATION) BIOLOGICALLY CONSIDERED. Anthony Bassler, M.D., F.A.C.P. Illustrated with 16 text cuts, 433 pages with index, reference from Epistle of St. Paul, dedication—In Memoriam, preface by the author, contents, 4 charts inserted immediately following the index at the back of the book. Price: $6.00. Philadelphia; F. A. Davis Company, Publishers, 1930.

An incentive to research and a stimulus to painstaking, unrelenting study, the work embodies the treatment of 5,000 patients, seen during a period of 30 years of the author's own experience. The work involved constant research, examination, checking and rechecking, with estimations of immediate results and those apparent years after termination of treatment. The clinical side of the subject is handled with the clinical entity terms in specialty groupings used as headings.

The charts inserted in the pocket in the back cover of the book minutely consider: 1. Cultural Characteristics of the Intestinal Pathogenic Organisms. 2. Cultural Characteristics of the Intestinal Saprophytic Organisms. 3. Cultural Characteristics of the Intestinal Zymogenic Organisms. 4. Cultural Characteristics of the Intestinal Non-pathogenic Organisms.

As a reward for this expression of his life's work may the author's wish in the preface be fulfilled!

Lillian L. Nye, M.D.

WHAT THE PUBLIC SHOULD KNOW ABOUT CHILDBIRTH. Gossett. 290 pages, $2.00. The Midwest Co., Minneapolis, 1931.

There is nothing in this book about childbirth that the public should know. There is a great deal that the public may know. The welfare of the individual patient and the maternal mortality rate can be best served if the public follows a brief instruction that can be summarized in eight words. "Engage your physician early; follow his instructions faithfully."

There is a great deal in this book, however, that the physician should know and also that he may know.

A. G. Schulze, M.D.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

FOR SALE—Office equipment including X-ray. Location in Minnesota town of 1,400 people. Average income of over $5,000 yearly for the past eight years. Unopposed. Specializing. Address D-150, care Minnesota Medicine.

GRADUATE of medical secretarial course, Rochester Junior College, Rochester, Minn., desires work. References. Address D-152, care Minnesota Medicine.

FOR SALE—Office equipment of the late Dr. O'Hara including leather upholstered Yale operating chair, instruments, drugs, bandages, also medical books. Can be seen by appointment. Telephone Mrs. Lola O'Hara, No. 67, Janesville, Minnesota.

FOR RENT

Offices for physician and dentist; three rooms, near four large schools. Rent: $45 per month; 1st month free. Chas. F. Bruess, 1201 Rice St., St. Paul, Minn.

WANTED—Position as hospital laboratory technician or physician's office assistant. Experience and good references. Address D-151, care Minnesota Medicine.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

Vol. XIV DECEMBER, 1931 No. 12

MITRAL DISEASE IN ADULTS*

Henry L. Ulrich, M.D.
Minneapolis, Minnesota

ACUTE rheumatic fever is not a killer. If it affects the valves of the heart it usually cripples. The postmortem statistics of the Department of Pathology at the University show that the highest death rate for acute rheumatic heart disease occurs in the second decade; for unhealed valve defects, in the fourth decade; for healed valve defects in the fifth decade. One patient in four or five with mitral valve disease lives to the fifth decade or beyond (Levine,[2] Boas,[3] Cabot.[4] Another point of interest is that many of these cases have a long latent period, twenty, thirty or forty years, before symptoms which lead to death appear. Like so many entities which have a long chronicity or latency, they drift into an age zone, in which degeneration processes begin to manifest themselves. The associated complications which arise in mitral valve disease in the adult are not so clearly understood nor appreciated. The most common of these which lead us into difficulties are: (1) auricular filbrillation; (2) hypertension; (3) hyperthyroidism; (4) pulmonary arteriosclerosis.

Auricular fibrillation is the most common complication and most easily recognized. It occurs in other conditions such as coronary disease and hyperthyroidism. Sixty per cent of all patients with mitral valve disease eventually develop fibrillation. Its effects on the integrity of the heart, and its treatment are so well known we will not dwell on it. Suffice it to say that it is the one intrinsic cardiac factor, that is arising in the heart itself, and that it usually accompanies one of two other complications of which we will speak, *i.e.*, hypertension or hyperthyroidism.

It is in the fifth decade that hypertension usually manifests itself. It is reasonable to suppose that a certain number of patients with mitral valve disease and attaining that age will develop hypertension. Of a hospital population of 762 patients with mitral disease, 159 (21 per cent) lived into the fifth decade or beyond. Of these 159 cases, 58 per cent had hypertension (Levine[2]). In a dispensary population in the fifth decade with all types of complaints, 50 per cent had hypertension (Weatherby[5]). The closeness of these figures justifies the assumption that hypertension complicating mitral valve disease is an inheritance of the years. If we compare Levine's figures of hypertension in mitral disease with any other disease entity in the same decade the manifestation of hypertension in mitral disease is most striking. Levine, in his discussion of the subject, brings out the point that hypertension in mitral disease is a salutary symptom. The increased pressure on the left heart increases the aperture of the stenosed valves by dilatation and hypertrophy of the left ventricle. And again the increased pressure on the left side permits an easier adjustment of the balance between the two ventricles. For which reasons he thinks hypertension is a factor in the longevity of these patients. Personally I am not in accord with this assumption. In the cases I have seen, the inception of this complication has simply added another load to the heart and thereby hastened rather than retarded decompensation. The factor of longevity in a given case lies somewhere else.

I have been impressed with the number of patients with mitral disease who manifest symptoms of thyroid intoxication. While this is prevalent in women patients it is seen at times in men. There are no statistics on this form of complication. In my own experience it is more commonly found in the fourth decade. The "thyroid heart," toxic adenoma masquerading as heart disease, is well known and better recognized than formerly—but heart disease (mitral defect) with thyroid symptoms is exceedingly difficult to adjudicate. The difficulty here lies in the fact that the symptoms may be larval in character. Again the expression of the thyroid intoxication may be limited to one organ, the heart. And, once more, the basal rates are not particularly increased (Morris[6]). In fact, basal rates in these cases must be carefully weighed, for an increase may be present due to dyspnea. This picture of cardiac irritability and unstable vegetative system in mitral disease has intrigued me so much that whenever I have had no success with rest and digitalis I suspect a thyroid complication. A trial with Lugol's solution, or even thyroidectomy, is justified.

---

*Clinic on Heart Disease given at the State Medical Meeting, Minneapolis, May 7, 1931.

The fourth complication, pulmonary arteriosclerosis, is still more obscure, both in its clinical and pathological awareness. By pulmonary arteriosclerosis I mean the senile changes in the pulmonary artery in contradistinction to primary sclerosis, which is a specific entity and which is a true arteritis. Senile changes in the pulmonary artery and its branches are seen in a group of different conditions, one of the commonest being mitral disease. It is assumed that the increased work of the right heart puts a strain on the pulmonary vessels which induces the senile changes. Dilatation of the larger vessels with sclerotic plaques is usually found. If the changes are sufficient in amount (macroscopic) the physiological function of the lesser circulation is diminished, adding another link (cyanosis) to the chain of deficiencies in an impaired circulation. We have no statistics in this department on how often pulmonary arteriosclerosis accompanies mitral disease. Consciousness of this defect is comparatively new, both clinically and pathologically. Ljungdahl[7] in 1915 published postmortem studies of twenty-five mitral cases of different ages; all of them showed varying degrees of sclerosis, nine being marked (macroscopic).

The difficulty in discovering this condition clinically is much greater than at the postmortem table. Occasionally one can see the dilated pulmonary vessels pulsating during a fluoroscopic examination. On physical examination a cyanosis which occurs long before dyspnea, has been suggested as a sign. I am led to believe that an accentuated systolic bruit heard all over the chest and the expansile pulsation of the lungs felt between the ribs on palpation may be clinical criteria of value. These findings are so new, however, that I am mentioning them in a tentative way.

CASES

The first case I wish to present is that of a colleague, and because of this he is not present here in person. He is about fifty years old. About two years ago he noticed dyspnea and irregularity of the heart. Up to this time he had not known of any symptoms referable to the heart nor was he ever conscious that he had a heart. He had worked very hard as a country practitioner earlier in his life and gave no history of rheumatism.

His heart silhouette is that of the mitral type and his esophogram shows marked enlargement of his left auricle. At this time, he was fibrillating and his bood pressure was within normal limits. We encountered difficulty in reducing his rate by rest and digitalis. There was a good deal of bronchial irritability and much sweating. His basal rate was +17. Not until we gave him Lugol's solution did his heart quiet down. He returned to work.

Nine months later he again suffered from cardiac decompensation. Besides his fibrillation his bood pressure had now risen to 180 systolic and the diastolic was hard to evaluate. Another course of rest, digitalis, and Lugol's has brought him back to compensation, but his hypertension persists. His second series of X-ray plates show that the heart has enlarged in lateral diameter 1.5 cm. from the previous readings. Here is a man who never gave a history of rheumatism, who lived to be 48 years old without manifestation of heart disease, who no doubt has had a mitral heart for years, and who now has auricular fibrillation and hypertension.

The second case is a woman thirty-three years old. She has not been feeling well for about a year. During this period she has noticed nervousness, palpitation, gas in her stomach with belching. She is emotionally unstable. There is loss of about 20 pounds in weight since December, 1930. She gives a history of rheumatic fever at the age of thirteen and again at twenty-one. She is married, has four children, the youngest seven. There was an acute attack of some infection in March, 1931.

There is definite mitral disease demonstrated by the physical examination and X-ray silhouettes. There is cardiac irritability manifested by tachycardia, and an unstable vegetative nervous system. In the lower pole of the right lobe of the thyroid a definite nodule can be made out. Her heart is regular. Her basal rate is normal. She had been at the hospital three weeks under rest and digitalis without any results. The addition of Lugol's to her treatment has changed the picture materially. She is now less irritable, her heart rate has slowed down, and the additional tachycardia which manifested itself when someone entered the room has disappeared.

This woman will be sent home with instructions to take Lugol's solution at intervals. If this does not control the situation, a removal of the adenoma will be done.

The next case is a young woman twenty-seven years old who entered the hospital on the orthopedic service to have a bunion removed.

Six days after her entrance and four days after the operation she had an attack of paroxysmal tachycardia with marked cyanosis, which morphine relieved. She gave a history of having had periodic attacks of palpitation, dyspnea on exertion, and edema of the ankles of moderate degree. There are pelvic deposits, with a history of two miscarriages. The heart symptoms have been present for fourteen years. There is no history of rheumatism, but much tonsillitis. Her physical examination suggests mitral disease and the X-ray plates of her heart confirm these findings. There is a mitral bulge and a moderate impingement of the left auricle on the esophagus. But, what is more interesting, on fluoroscopic examination, it was found that her pulmonary vessels were pulsating way out into the mid-lung areas. She presents, too, the physical signs which I have mentioned—a systolic bruit all over her chest and an expansible pulsation in the intercostal spaces. We expect to learn a great deal from this patient about pulmonary arterio sclerosis.

The last patient I wish to show does not belong in this group at all.† She is shown, however, because she was sent in from the State Sanatorium to settle the question whether she has tuberculosis, heart disease and hyperthyroidism.

She is the type of case of which there is one or more in every community. Her complaint is weakness, fatigability, dyspnea and palpitation, undernutrition, lack of appetite, pain in left chest over the heart, diarrhea (six stools a day), and some pain in the lower abdomen. She describes her condition exactly when she says, "I am not well, nor am I sick." There is cough, no positive sputum, but she has had eight to ten blood tinged sputa. She has been at the Sanatorium for seven years. Two years ago we studied her and decided she had fibrotic pulmonary tuberculosis, mild mitral disease, and possibly tuberculosis of the cecum. At the present time we have decided she has a minimal amount of tuberculosis and no mitral disease.

There are murmurs over the heart but they are extrinsic in origin—possibly due to a slight displacement of the mediastinum caused by pleuro-pericardial adhesions. She is markedly underweight and suffers from neuro-circulatory asthenia. Her basal rate is not increased. The factor which to my mind is underlying a good deal of her symptomatology is her diaphragm. Her diaphragm is very low. Because of its low position,[8, 9] the circulatory function of the organ is severely impaired, producing dyspnea, palpitation, and fatigability. With an increase in weight and a suitable pad which will increase her intra-abdominal pressure the diaphragm will go up and thus restore the circulatory efficiency of the organ. While the patient has tuberculosis, its minimal quantity and its lack of progress over these seven years make me believe the diaphragm is more important in her symptom-complex It is this finding, so readily overlooked, which made me make the statement, "There is one of this type in every community."

In closing I wish to reiterate that in any adult mitral disease which does not respond to rest and digitalis—look out for one or all of the complications I have mentioned today.

BIBLIOGRAPHY

1. Clawson, B. J., Bell, E. T., and Hartzell, T. B.: Valvular diseases of the heart. Am. Jour. Path., 2:193.
2. Levine, S. A., and Fulton, M. N.: The relation of hypertension to mitral stenosis. Tr. Assn. Am. Phys., 43:31, 1928.
3. Boas, E. P., and Fineberg, M.: Hypertension in its relation to mitral stenosis and aortic insufficiency. Am. Jour. Med. Sci., 172:648, 1926.
   Boas, E. P., and Perla, D.: Mitral stenosis after the fifth decade of life. Ibid., 170:529, 1925.
4. Cabot, R. C.: Mitral stenosis. Trans. Assn. Am. Phys., 29:22, 1914.
5. Wetherby, Macnider: Unpublished paper.
6. Morris, R.: The thyroid heart with low basal metabolic rate. Am. Jour. Med. Sci., 181:297, 1931.
7. Ljungdahl, Malte: Untersuchungen uber die Arteriosklerose des kleinen Kreislaufs. Wiesbaden Verl. von J. F. Bergmann, 1915.
8. Hitzenberger, Karl: Die Bedeuting der Physiologie u. Pathologie des Zwergfells fur die Untersuchung am Krankenbett. Verl. von Julius Spingen Wien., 1924.
9. Wenckebach, K. F.: Uber Pathologische Beziehungen zwischen Atmund und Kreislauf bein Menschen. Sammlung Klin. Vortrage (Inn. Med.), 137-166:131.

---

†This case is brought into the discussion with the full knowledge of how a digression weakens one's theme. I take this risk for the sake of calling attention to an organ whose clinical and physiological concepts are little known.

TRICHOMONAS VAGINALIS VAGINITIS*

Russell J. Moe, M.D., and W. A. Coventry, M.D.
Duluth

THE frequent occurrence of *Trichomonas vaginalis* vaginitis has activated an interest which has now reached its peak since the discovery of the causative organism by Donné in 1836. By establishing a practice of examining microscopically all cases of vaginal discharge and irritation and to look especially for *Trichomonas vaginalis*, we have been appalled at the number of cases in which we find this organism. Still more pleased are we with the results we have obtained from the line of treatment we have instituted.

The organism, *Trichomonas vaginalis,* is a protozoan flagellate which is typically pear-shaped, but may be ovoid, spindle-shaped, or irregular. At its anterior end there are free flagella, usually four in number. An undulating membrane extends backward about one-half the length of the body and an axostyle projects from the posterior end. The size varies from 15 to 25 microns in length and 10 to 15 microns in width. It attracts one's attention, when seen under the microscope, by its peculiar jiggling motion which is a distinguishing characteristic.

In obtaining a specimen, the discharge is collected on the long blade of a non-lubricated bivalve speculum and a small portion transferred to an ordinary glass slide. One drop of warm normal saline solution is added and a cover slip applied. Examination under the high dry lens of the microscope will then easily and readily reveal the presence or absence of the organism. Its jerky but progressive motion is exceedingly characteristic. There will also be seen in the field numerous leukocytes, squamous epithelial cells and bacteria.

The exact mode of infection is unknown at the present time, but the possibility of contamination from the intestinal tract has been suggested by a number of writers. However, recent investigation by Bland, Goldstein and Wenrich indicates that the *Trichomonas vaginalis* is definitely distinct from the other species of *Trichomonads* found in man. That the organism has been difficult to culture on mediums that proved to be very favorable to the other *Trichomonads* would also indicate that the vaginal type belongs to a different species.

The clinical picture of this form of vaginitis is characteristic. There is always a vaginal discharge which is accompanied in 75 to 80 per cent of the cases by an irritation or itching about the external genitalia. The discomfort is quite marked and the patient often is relieved, temporarily, by taking a douche. Another finding which is suggestive is the appearance of the discharge. Typically it is thin, foamy, not at all tenacious, greenish yellow in color, and the odor is rather characteristic and disagreeable. In the non-irritating case one finds the discharge to be thicker, not foamy, creamy yellow in color and the odor less pronounced. There are, however, varying grades between these two types of cases. Many patients complain of symptoms merely for a few days just preceding or following the menstrual period. In the characteristic case with the above symptoms one is negligent if he does not look for *Trichomonas vaginalis.* At the same time one is often surprised to find the organism in a patient who does not present the classical symptoms.

Severe cases present a roughened vaginal epithelium with small elevated points which bleed rather easily, especially when touched with gauze or cotton. The vaginal walls and tissues adjacent to the introitus are hyperemic and present very much the same picture as seen in acute gonorrhea. There is no doubt but what many cases of *Trichomoniasis* have been treated as Neisserian infections because of the marked similarity in the appearance of the acute cases.

The incidence of simple *Trichomonas vaginalis* vaginitis with lesions of the cervix and neighboring organs is interesting. It has been our observation that cervical erosions are not common and are not a factor in the production or the presence of this type of vaginitis. In the treatment of a *Trichomonas* infection it is not necessary to treat an accompanying cervical erosion *per se.* However, after the organism has been eradicated from the vagina the cervical condition may be treated properly by cauterization methods. We have had one case of accompanying cystitis in which catheterized specimens of urine revealed the *Trichomonad.* We have not been able to recover the organism from the stool. Greenhill reports a number of cases in which he has done insufflation of the tubes in the presence of *Trichomonas vaginalis* without any untoward effects. The danger of spreading the infection higher up in the genital tract apparently does not exist.

---

*From the Department of Gynecology and Obstetrics, Duluth Clinic, Duluth, Minn. Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 6, 1931.

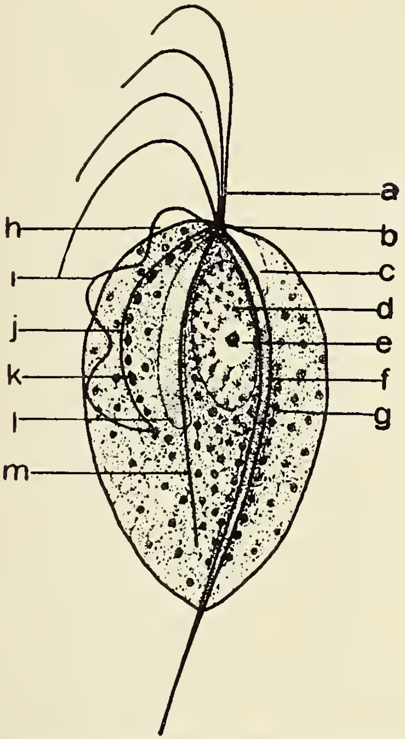


Fig. 1.—Diagrammatic representation of Trichomonas vaginalis combining the characteristics that have been revealed by different methods of staining: *a*, anterior free flagella; *b*, blepharoplast; *c*, cytostome; *d*, nucleus; *e*, caryosome; *f*, axostyle; *g*, chromatic granules along the axostyle; *h*, undulating membrane; *i*, posterior flagellum forming margin of the undulating membrane; *j*, chromatic basal rod; *k*, chromatic granules along the chromatic basal rod; *l*, sausage-shaped part, and *m*, fibrillar part of parabasal apparatus. (Drawn by D. H. W.)

Fig. 1. Trichomonas vaginalis, after D. H. Wenrich, Ph.D.

The number and variety of treatments that have been proposed indicates that as yet no specific treatment for this condition has been found. Most any treatment which destroys the organism and thoroughly cleanses the vagina will produce satisfactory results. Our treatment consists of what we have termed a "pressure douche." The office procedure is a very practical one and requires no expensive equipment. Home treatment consists of the application of a few well known principles properly handled. We have tried a number of treatments that have been recommended heretofore and have discarded them largely because of the discomfort to the patient and because they do not, in our opinion, accomplish what we believe to be the underlying principle of all treatment, namely, that every portion of the vagina must be reached in order to properly exterminate the organism. We believe that we have accomplished this by what we call the "pressure douche."

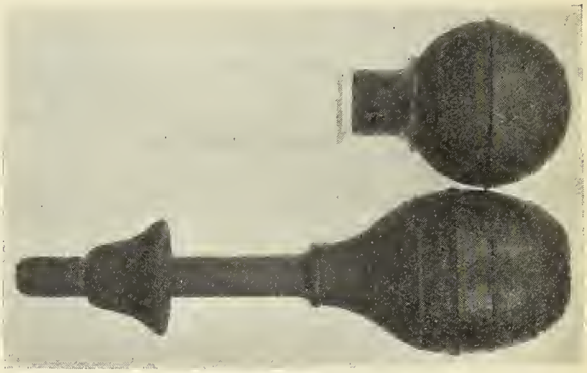


Fig. 2. *(Upper)* Glass douching syringe (Capacity 120 c.c.), blunt tip and rubber bulb. *(Lower)* Douching syringe with movable flange (Capacity 180 c.c.).

In the office treatment, which is always the first treatment instituted, the patient is placed in the lithotomy position on a bed pan with the knees up in stirrups. The external genitalia and vaginal orifice are cleansed by mopping with an antiseptic solution; oxycyanide of mercury (1:2000) or lysol (0.5 per cent). Following this a 120 c.c. glass syringe with a blunt tip and rubber bulb or an ordinary douching syringe is filled with the same antiseptic solution. The blunt point is held firmly against the introitus; the rubber bulb is then compressed, forcing the solution into the vagina, which becomes so distended that the folds and rugæ disappear and the solution comes into contact with the entire surface. By releasing and reapplying the pressure on the rubber bulb the solution may be "swished" back and forth between the syringe and the vagina. This procedure is repeated with clean solution several times until the vagina is thoroughly cleansed. The syringe is then filled with 4 per cent silver nitrate solution, which is injected into the vagina and held under pressure for a period of three minutes. There is a slight discomfort after the silver nitrate injection, but it is immediately relieved by washing the vagina again with the first antiseptic solution.

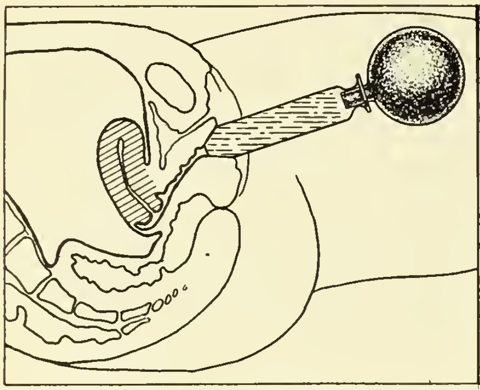


Fig. 3. "Pressure douche." Glass syringe containing antiseptic solution held firmly against the introitus.

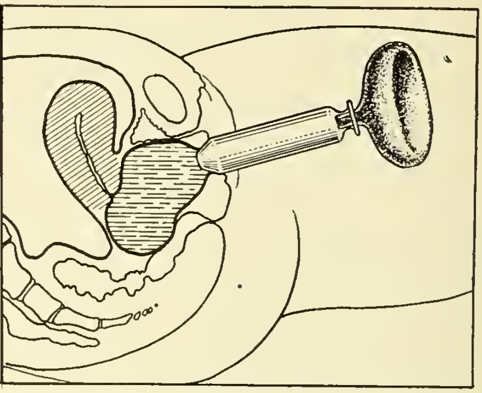


Fig. 4. "Pressure douche." Rubber bulb has been compressed, forcing solution into vagina, producing a distending or ballooning effect.

Home treatment attempts to accomplish what we have instituted at the office, that is, the "pressure douche." By holding the lips of the vulvæ firmly about the douche point, the vagina is thoroughly distended four or five times instead of taking a continuous flowing douche. The patient is also instructed in matters of anal hygiene.

Theoretically, one thorough treatment should effect a cure. We have found that practically all smears are negative after the first treatment and the itching and discharge are greatly relieved. So striking is the latter that some patients believe that they are cured and do not report for further treatment, only to return later with a reappearance of symptoms. Therefore we have been a little more insistent than usual that they follow up the initial method of treatment that we have outlined, namely, to report once a week for treatment at the office and to take a daily douche at home. They may be discharged after two consecutive negative smears have been obtained, with instructions to report again three or four days after their next menstrual period.

During the past eighteen months we have treated 95 cases of *Trichomonas vaginitis,* 68 per cent of which have been cured, 15 per cent are under treatment at the present time and 17 per cent have been referred to their home physician or have not returned. Four cases were associated with pregnancy and were treated by the "pressure douche" method. We do not believe that the incident of pregnancy need make any difference in the treatment of the vaginitis. One case of especial interest occurred in a twenty-four year old virgin with a cribriform hymen. All the classical symptoms were present. Smears taken from the vulva revealed no organisms, but the symptoms were so characteristic that we felt justified in insisting on smears being taken from the vagina itself. Under gas anesthesia this was done and the vagina was found to be filled with a foamy material which was literally teeming with *Trichomonas vaginalis.* One patient had been advised to have a complete hysterectomy, in order to control this intensive itching and discharge. A few treatments of the local condition cured her. A number of patients had cauterization treatments to the cervix without any relief of symptoms, but were completely cured by the treatment of the vaginal cause of the infection. A few patients were previously diagnosed as gonorrhea because of the profuse discharge. Examination of the discharge revealed *Trichomonas vaginalis* and proper treatment readily effected a cure.

Before presenting the slides I wish to make this plea—that all cases of vaginal discharge be studied more intensively. By this intensive study more cases of *Trichomonas vaginalis* will be found, proper treatment instituted and the patients will be cured of a very distressing and discomforting complaint.

SUMMARY

In treating a patient with a vaginal discharge, *Trichomoniasis* must be considered in the realm of probabilities. It is very prevalent, the mode of transmission of the infection being unknown. The history and clinical picture are characteristic and typical, while the method of diagnosis and the recognition of the organism present no unusual difficulties. The "pressure douche" is a satisfactory method of treatment and will cure practically all patients if properly carried out. This method is safe, effective, simple and inexpensive, and is described here in the hope that it may prove as valuable to others as it has to us. Pregnancy is not a contra-indication to treatment by the "pressure douche" method. The writers report 95 cases of *Trichomonas vaginalis* vaginitis, 68 per cent of which have been cured, 15 per cent are under treatment at the present time and 17 per cent have been referred to their home physician or have not returned.

BIBLIOGRAPHY

1. Bland, P. Brooke; Goldstein, Leopold; Wenrich, David H.: Vaginal trichomoniasis in the pregnant woman: A clinical and morphological study. Jour. Am. Med. Assn. 96:157 (Jan.), 1931.
2. Davis, C. H.: Trichomonas Vaginalis Donne: experimental and clinical observations. No. Am. Gynec. Soc. 1929, 54:104, 1930.
3. Idem: Leukorrhea, with special reference to Trichomonas vaginalis. Am. Jour. Obst. and Gynec. 18:196 (Aug.), 1929.
4. Donné, A.: Recherches microscopiques sur la nature des mucus et la organes genitourinaires chez l'homme et chez la femme. Publ. by author, Paris, 1837.
5. Greenhill, J. P.: Vaginal discharge due to Trichomonas vaginalis. Am. Jour. Obst. and Gynec., 16:870 (Nov.), 1928.
6. Hegner, R. W.: Trichomonas vaginalis Donné. Am. Jour. Hygiene, 5:302 (May), 1925.
7. Kleegman, S. J.: Trichomonas vaginalis vaginitis. Surg., Gynec. and Obst., 51:552 (Oct.), 1930.
8. Schmid, A. L., and Kamniker, H.: Trichomonas vaginalis: Morphology, clinical significance and treatment. Arch. f. Gynäk., 127:362, 1928..

TREATMENT OF SALPINGITIS*

William H. Rumpf, Jr., M.D.
Saint Cloud, Minnesota

THE keynote of the treatment of salpingitis, used in the broad sense of pelvic inflammatory disease, is conservatism. A small minority of cases will require operative or radical measures to effect cures. Even in these patients preservation of function should temper surgical enthusiasm.

The pelvis is peculiarly well adapted to defend itself from bacterial invasion. The rich blood supply, the extravagant lymphatic system and the functional downward drainage of the genital tract are the Marines of defense. They are, however, not incorruptible. For, when venereal disease, careless parturient handling, or the organisms from other sources enter, the very nature of its anatomic structure promotes rapid spread of infection yet retaining the inflammation within itself. The heavy uterus and appendages tend to become displaced backward within the pelvis and Nature tries to wall off the infection from the abdominal cavity. Therapeutic efforts should be supportive. The less original the method, the more coöperative will the physician find Dame Nature!

Statistics reveal that the gonococcus is responsible for 75 per cent of cases of salpingitis; 20 per cent are produced by the other major pathological bacteria of postpartum, postabortal or blood-borne sources; while the tubercle bacillus is charged with about 5 per cent of cases. Prophylactic measures may be considered properly at this time.

Gonorrheal salpingitis is a self-limited disease. Recurrent attacks are practically always reinfections or the result of secondary pyogenic invasion. Unless the vulvovaginal and cervical glands are freed from the gonococcus, reinfection is not only possible, but is adequately assured. The nasal tip electric cautery is the outstanding instrument of therapeutic destruction. I have had some success in injecting an 8 per cent mercurochrome ointment through a blunt hypodermic needle into Bartholin's duct, putting the needle in before attaching a small syringe.

The obstetrical mortality and morbidity rates, as far as sepsis is concerned, are the most convincing arguments for less meddlesome midwifery. There seems to be no way to compel the abortionist to complete the "cure" he started. The current depression has not affected this group. There is hope that the exanthemata will disappear, and this source of infection be minimized. Tuberculosis, too, is being conquered.

Acute and subacute pelvic infections should be treated expectantly. These cases are literally hot. The surgical principles of the appendix are not applicable to an acutely inflamed tube. Conservative treatment means helping nature localize the infection in the pelvis and build up an immunity against the bacterium. It means saving organs and preserving their proper function. The patient should be in bed and remain there until the infection has had time to cool off. Elevation of the bed or patient tends to prevent the spread of the infection upward. An ice bag or cold pack across the lower abdomen is comforting to the patient. Fluids should be forced and a bland diet maintained. Bowel elimination is encouraged by low enemata and mild saline catharsis. Pain is relieved by the coal tar derivatives and by pantopon if necessary. Fresh air is essential. After the diagnostic bimanual examination when cervical and urethral smears are taken, no further pelvic manipulations are advisable unless complications are suspected by persistence of fever over nine or ten days. Coitus or courting are forbidden. Foreign protein injections are usually beneficial during this stage.

Post abortal and puerperal streptococcic infections are most serious and often fatal. If blood culture reveals the hemolytic variety, various intravenous bacteriacides, such as metaphen, are recommended, or antistreptococcal sera also have their place. Small repeated blood transfusions are of definite benefit. Operations are always menacing in this type of "concrete-filled" pelvis.

A regime of palliative expectancy will permit the subsidence of the acute process in the majority of cases. An elevated temperature after ten days is indicative of complications or pus collection. Abscesses of this type should, of course, be drained. The vast majority can be well emptied by the vaginal route. A posterior colpotomy with insertion of a self-retaining drainage tube after pockets have been broken up with the examining finger, is the operation of choice. Occasionally, the drainage of pus collections higher in the abdomen by the abdominal approach is necessary. There is no other place for surgery in dealing with acute salpingitis.

---

*Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, May 6, 1931.

Invalidism produced by chronic infections manifests itself in dull heavy pains across the lower abdomen which are accentuated during menstruation. Metrorrhagia and leukorrhea are usually present. The findings of a retroverted uterus with pelvic masses, and the history, substantiate the diagnosis. If the physician has confidence that good results are obtainable by noninterference, the patient will reflect that attitude and will have the courage and desire to give the conservative treatment several months trial, in a hospital, if possible.

Heat in this stage is beneficial and comforting. Dry heat from one of the standard bakers having banks of lights reflecting the heat downward over the lower abdomen is efficacious. Moist heat from prolonged hot douches is an efficient means of producing absorption of inflammatory masses, if the infection has quieted down. By a long hot douche, I mean the use of a minimum of five gallons of a weak potassium permanganate solution as hot as the patient can stand it (usually at 115 to 118 degrees Fahrenheit). This is allowed to run in slowly to consume twenty to thirty minutes. The patient should be lying down either in a bathtub with the hips elevated somewhat, or on the examining table. Makeshift arrangements can be made at home. I have cheap metal pails prepared with an outlet pipe to fit the ordinary fountain syringe tubing for use at home. The pail holds three gallons and may be filled twice. Many of my farmer patients put such an outlet on a milk can, and utilize it later as a shower bath for the children. I also have an outfit for office use connected directly with the plumbing.

Besides local treatments of the cervix, occasionally the trial of vaccine therapy and foreign protein injections has a place. I have not been an enthusiastic advocate of these measures. Diathermy has a limited field in the chronic types in the absence of any pus.

General and supportive measures to build up the patient by a nourishing diet, fresh air, ultraviolet rays, iron and arsenic, liberal exhibition of potassium iodide, tonics and cod-liver oil are, in my opinion, of greater value than most of the so-called, therapeutic conservative aids.

When the temperature has remained normal for several weeks, and does not rise with repeated pelvic examinations or hot douches; when the leukocytic counts shows a normal or nearly normal level; when the sedimentation of erythrocytes shows the normal rate of twelve or more hours; when the general condition as to blood pressure, cardiac and renal function does not contraindicate, it is proper to think of an operation, provided the patient has not recovered under really conservative treatment.

There are other factors that one must consider when the decision to resort to surgery is reached, such as the question of sterility. There are many instances of marital infection particularly of the gonorrheal type with definite pyosalpinx when conception has occurred as long as fifteen years later. There can be no other explanation than that of healing with restored tubal patency. Indeed, many of these tubes can be blown open by transuterine insufflation or the obstruction located with lipiodol salpingography. A conservative operation as salpingostomy is indicated in this type. The psychical effect of menstruation is important, and its preservation sought. Radical operators occasionally lose sight of this factor. A thorough examination under anesthesia will very often result in postponement of operative measures. It may suggest cauterization for endocervicitis to relieve a lymphangitis which on examination without anesthesia may simulate a salpingitis. Rectal or bladder pathology or the symptoms referable to poor posture and visceroptosis may cloud the picture. Complete examination will save possible embarrassment to the hasty surgical technician who rushes in and discovers only an innocent oviduct. The trained gynecologist makes good use of the rectal examination, speculum examination and examination under anesthesia.

Granted that conditions and symptoms warrant operation, the method will depend upon the findings, the age of the patient and the nervous temperament of the individual. Most patients requiring laparotomy have a combination of ovarian, uterine, and pelvic peritoneal involvement with extensive adhesions to coils of bowel. The young individual should be given a chance for future pregnancy even if it is very meager. To remove the uterus completely will, of course, abolish menstruation. If the patient has this function preserved, the psychological shock will be reduced, and menopausal symptoms delayed or lessened, which would not be the case if complete pelvic extirpation were carried out. The more high strung the woman the more imperative it is to conserve organs, and the function of one ovary at least should be saved. Resection of portion of an ovary is in the main not satisfactory, and often leads to retention cysts requiring secondary operation. A boggy infected uterus is better out although defundectomy of the Bell-Beuttner (or other) type with preservation of some endometrium has much to recommend it from the standpoint of continuing menstruation. The simple removal of one or both tubes is best accomplished by complete wedge shaped excision of the uterine horn, rather than to leave this often infected tubal portion. Hysterectomy is seldom required, therefore. Estes and others have advised transplantation of sections of the ovary into the cornuæ with the odd hope of pregnancy. I have had one case of conception follow this type of operation, which prompts me to continue the practice.

Replacement of the retroverted uterus should be done with peritonealization by an anterior pleating of the fundal portions of the round ligaments. A modified Baldy-Webster shortening again will give some support to the remaining ovaries as well as hold the uterus forward.

Pelvic tuberculosis, however, requires less conservatism, for, as Reuben Peterson and others have shown, better end-results follow radical removal of pelvic organs if the primary focus is not too extensive. The more tuberculous foci that can be removed, the better are the chances for ultimate cure of the patient. If less radical procedures are chanced, the cessation of menstruation by means of partial castration doses of X-ray will aid immeasurably in the cure.

J. V. Ricci reported in the New York State Journal of Medicine, January 1, 1928, a comparative study of three 200 case groups of salpingitis to show the value of conservative treatment. In 200 cases of acute non-operated salpingitis, there were no deaths; in 200 operated cases of the chronic non-purulent variety, there was one death; while 29 deaths were present in the series of 200 operated cases of acute and chronic disease. This last group also was forced to stay in the hospital an average of three months as against two weeks for the non-operative and an average of three weeks for the chronic cases that were operated upon.

The gynecologist has recognized the superiority of the conservative treatment of salpingitis for years, has preached it, and has been gratified at the trend in the past few years away from radical, unnecessary and dangerous operations. There are a bare 15 per cent of cases of salpingitis that require operation, and it is hoped that preventive measures can reduce this to a lower percentage. Surgery has no place in the treatment except the opening of abscesses, until the infection has had time to cool off. In the small percentage of cases requiring symptomatic interference, conservative surgery should be practiced, to preserve reproductive functions. Salpingitis, per se, should be treated palliatively, expectantly and conservatively.

HISTORIC REVIEW OF AMERICAN AND ENGLISH LITERATURE ON VITAL CAPACITY*

WILLIS S. LEMON, M.D.
Rochester, Minnesota

AMONG the major functions of the body, respiration received only late attention, and knowledge regarding its physiology was slow and much interrupted in growth. A beginning was made in the seventeenth century by the work of Boyle, Mayow, Descartes, Lower and Hooke. Mayow came very close to the discovery of oxygen, and really formed an accurate estimate of the relationship between muscular work and increased respiratory action.

Priestley and Lavoisier, by brilliant work in the discovery of oxygen, really laid the foundation for all future physiologic effort in this direction. Bonili, in 1679, was the first who tried to determine the volume of air in the lungs and he made an experimental study of the amount of air received by a single inspiration. Jarvin, in 1718, noted differences in quantity not only in different persons but in the same persons at different times. Hales, in 1728, made specific measurements of the amount of air in the lungs, and was the first to ascertain the force brought to bear in breathing by using a mercury manometer. Goodwyn, in 1788, first estimated the amount of the residual air. Keill, in 1708, made correct cubic measurements of the air exhaled from the lungs. The fundamental knowledge was now available for Hutchinson's study on vital capacity, and his was a model for even modern research.

FUNDAMENTAL INVESTIGATIONS

Hutchinson acquired exact knowledge of the work of all previous investigators, not only on the same subject, but also on subjects relating to physiology of the circulation and to the composition and pressure of the atmosphere. He seems also to have been the first to develop a fundamental conception regarding the relationship existing among the several parts of the body. He wrote: "Our structure is like a complicated machine, each portion bearing a certain relation to another, just as the wheels of a clock do to the length of the pendulum; for every length of pendulum demands its own peculiar train of wheels so calculated as to number its oscillation; this oscillation regulates the whole machine. In like manner, the respective development of every man is regulated by some certain and constant capacity or measure of his digestive system as absolutely essential to his respective development. One of the fundamental rules in architecture is 'proportion,' the relation that the whole fabric has to its constituent parts, and which each part has to the complete idea of the whole, for in buildings that are perfect in their kind, from any particular part, an architect may form a tolerable judgment of the whole; just in like manner, the physiologist, from a portion of the viscera, say an organ, should be able to form a tolerable judgment of the whole man from whom it was taken."

Hutchinson's first lecture was given in 1844 on the subject of vital statistics, embracing an account of a new instrument for detecting the presence of disease in the system. He gave the name spirometer or breathmeter to this instrument. He conceived the idea that practitioners of medicine might be benefited if they could by any means measure accurately the volume of air breathed out at one full expiration, together with the power exercised by the muscles of expiration and inspiration concerned in the effort. Before he arrived at any conclusions, or made any report on his work, he had examined more than 1,200 persons of different classes and occupations. He found that tall, thin men had the greatest vital capacity, and this fact led him to make the measurement of height the chief consideration in his observations. He believed that no other physical sign could be so steady a guide as that of height, because it does not vary in disease or in health, in adult life or in old age, although weight and breadth vary at all periods of life. His invention of the spirometer made the easily determinable vital capacity the central point in spirometry until the time of Bohr, half a century later (Lundsgaard and Van Slyke).

---

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Submitted for publication May 19, 1931.

Hutchinson, in his first paper, in 1846, arranged the quantity of air in the thorax under different conditions that are dependent on thoracic movement, under five heads as follows: (1) residual air, (2) reserve air, (3) breathing air, (4) complemental air, and (5) vital capacity. To the last three divisions combined, being the greatest voluntary expiration following the deepest inspiration, the term vital capacity is applied; that is, the sum of the reserve air, breathing air and complemental air is equal to vital capacity.

As already observed, various measurements had been made but Hutchinson seems to have been the first to estimate the limits of the quantity of air under each of the five conditions that are dependent on thoracic movement. He laid down the first rules regarding standards of measurement so that estimated normal amounts of air might be compared with actual spirometric readings in health and disease. His investigation led him to inquire into the influence not only of height, which he considered his most accurate standard, but also weight, volume of thorax, circumference of thorax and sitting height and the influence of these factors, in determining the vital capacity. He came to the conclusion that the healthy vital capacity is chiefly affected by height, weight, and age, and he determined quantitatively the amount of variation that each brings about.

Not only was this study concerned with relationships affecting persons who were in good health, but also with similar relationships in persons who were ill. Hutchinson was the first to make a systematic study of the vital capacity in tuberculosis, of both early and advanced stages. He was able to anticipate the presence of pulmonary disease long before the most skilled clinicians could discover it by clinical methods then employed. In the period between 1846, when Hutchinson's paper appeared, and the beginning of the present century, papers were published by observers who either agreed or disagreed with Hutchinson, or who employed modifications of his instrument. I have been able to obtain sixteen articles written in this time.

Pepper considered the influence on vital capacity of mobility of the thorax and measured the difference in inspiration and expiration; he compared the capacity of healthy, robust, well developed active men, with that of small, feeble, underdeveloped persons living sedentary lives. Jackson and Lees also were concerned with the influence of muscular development on vital capacity. Pepper was the first to announce the effect of heart disease on the vital capacity, and noted that debility of patients with heart disease was insufficient to account for the large percentage of reduction in vital capacity. He then paved the way for the work of Peabody, which was to appear seventy years later. Pepper also confirmed the value of the spirometer in the early diagnosis of tuberculosis. He found that the degree of reduction in vital capacity corresponded with the greatest amount of pulmonary disease. It was observed that reductions in vital capacity consequent on injury to pulmonary tissue were increased by extrapulmonary conditions, such as enlargement of the stomach, liver, or spleen, and lesions that inhibited the movements of the wall of the thorax and of the diaphragm. General principles, therefore, regarding the cause of reduction in vital capacity were in the process of formation.

Schneevoogt and Voorhelm examined 300 men and women, some of whom were normal, and others of whom were diseased, and reported thirteen series of observations. They studied the vital capacity of healthy men and healthy women, of patients whose family history contained records of death from tuberculosis, of patients suspected of having tuberculosis and of others in various stages of the disease. They also tabulated results of examination of patients with pneumonia, emphysema, heart disease and deformities of the thorax, and were the first to recognize that the complications of pneumonia might be anticipated by a lowering of vital capacity when it should be rising. They failed to note the very great loss in vital capacity in pneumonia, and failed to point out the value of that fact in differential diagnosis. They also inquired into the effect on vital capacity of abdominal distention due especially to ascites and pregnancy, and were the first to give accurate figures representing the degree of loss in vital capacity, due to these causes.

Fabius added his observations of vital capacity after labor. His was the first voice raised in objection to Hutchinson's standard. He offered instead the measurement of the torso and the circumference of the thorax. However, Fabius agreed with former authors regarding the influence of age and muscular power, and the effect of tuberculosis. He added his own figures showing the reduction brought about by asthma, and by such abdominal disorders as constipation. In commenting on the efficiency of spirometry and the standard employed, Biegel wrote: "Simon, who has made many careful investigations, was of the opinion that the length of the thigh influences the amount of respiration. Fabius, however, found enormous disproportions." Biegel said: "By means of such numerous investigations as were made by Hutchinson, we might possibly find out a certain rule of proportion, and arrive at definite conclusion provided we could compare the ears, or any other part of the body, and amount of respiration of many thousands of men." This recalls the fundamental concept of Hutchinson which permitted him to establish his facts; namely, that the amount of respiration in man is in proportion to the height of his body, that the greatest respiratory power is found between the ages of twenty and forty years, and that with men of this age, for each centimeter of height, between 22 and 24 c.c. of air of expiration might be calculated, but for women the amount would be only between 16 and 17.5 c.c.

Gleitsmann, in 1874, began the first survey to evaluate the spirometric readings in relation to practical use. He studied applicants for life insurance who on examinations, by all means then available, were found to be without evidence of disease, yet whose spirometric readings were more or less palpably divergent from the calculated normal. He advocated use of the spirometer for life insurance examinations, because he believed that those with definitely decreased respiratory capacities were more likely than others to have tuberculosis, or to develop it later, and that they should not be accepted without reservation. These were the applicants who induced, in the examiner's mind, increased caution in passing judgment on their future health.

At about the same time, 1875, Elsberg and many other observers began thorough search for measurements that might permit normal figures to be established that would satisfy all the variables of age, sex, size, muscular development and strength, and the variations which occurred in disease. Elsberg's work is the first I have found that deals with the vital capacity of childhood. Waldenberg's work had already been reported. He considered the effects of inspiratory traction as well as of expiratory pressure, and thought them to be the products of various factors, some of a positive, some of a negative, nature. These factors are (1) muscular power; (2) elasticity of the lungs, and (3) obstacles presented by the walls of the thorax, its contents, and the neighboring viscera. These general principles led to studies of tuberculosis, emphysema, asthma, bronchitis, diseases of circulatory organs, asthenic states, and diseases of the central nervous system, especially progressive muscular atrophy and bulbar paralysis. Observers of that epoch were the first to consider dyspnea in relation to vital capacity, and urged spirometry as a means of denoting dyspnea with exactitude, both quantitatively and qualitatively, and as a means of showing whether it is inspiratory or expiratory or both.

Holden, like Gleitsmann, searched for practical applications of spirometry to diagnosis and treatment, and advocated its use to develop capacity of the thorax and to redilate cells that were collapsed and weakened by disease. It would seem that he used his specially devised instrument in much the same way as the instrument by which bottles are blown, but he had a musical instrument incorporated, the note of which was an index of the power employed.

By the close of the nineteenth century, largely through the stimulus provided by the investigation of Hutchinson, standards for development of normal readings had been set up. These took cognizance, especially, of the relationship of vital capacity to height, length of trunk, circumference of thorax, weight, sex and age. The observations included not only normal persons, but those who suffered from all manner of diseases. Decreases in vital capacity could be said to be due, as Peabody reaffirmed many years later, to: (1) anything which interfered with respiratory movements of the thorax, including muscular weakness, calcification of cartilages, arthritis, pleurisy, pleural effusion, and intra-abdominal conditions which might prevent free descent of the diaphragm, such as ascites, tumors and pregnancy; (2) inflammatory and infiltrative lesions affecting the pulmonary substance, such as pneumonia, tuberculosis, bronchiectasis, and carcinoma; (3) alterations of elasticity of pulmonary parenchyma, such as is produced by emphysema, and (4) increased pressure in the pulmonary circulation, and engorgement of the pulmonary vessels, such as occurs in cardiac decompensation with congestion of lungs, infarction, and effusion.

These authors of the nineteenth century employed the test of vital capacity to supplement physical examination, and expected it to show the presence of disease before examination could be expected to discover a lesion. They also employed it to determine the course, progress, prognosis and treatment of disease. Finally, they encouraged its use as an economic method for selection and observation of applicants for the Army and to exclude the unfit from the risks accepted by insurance companies.

OBSERVATIONS FROM 1900 TO 1930

Judging from the accurate and complete records that had been made by earlier observers, and their hearty endorsement of this method of examination, it would have been reasonable to expect enthusiastic continuation of work in the present century. The opposite was the case. Whatever the cause for lack of interest, whether there was a reaction from over-enthusiasm, whether there was dissatisfaction from inability to develop a standard measurement to embrace the many variable factors encountered, or whether because of the development of newer and accurate means of diagnosis, such as the roentgen ray, the test fell into disuse. About physiologic laboratories the spirometer became the spinning-wheel in the parlor; it was interesting to look at and blow into as a test of muscular strength but it was not seriously employed either in studying disease or in developing respiratory physiology.

In 1910, however, the spirometer was again of service in the examination of applicants for enlistment in the Army. Owen was of the opinion that the spirometric readings gave a more exact determination of physical fitness and pulmonary capacity than other measurements then in use, particularly that of expansion of the thorax. He also found that the liability of error was much less with the spirometer than with the tape measure.

The study of the vital capacity became universally stimulated in the years following 1913, when Hoover, Peabody and Wentworth, McClure and Peabody, Lundsgaard, Barker and Van Slyke began their studies on respiration. Their work led them to investigate acidosis in nephritis, the effects of carbon dioxide in the inspired air on patients with cardiac disease, the minute volume and alveolar air in pulmonary emphysema, the basal and the minute volume of the respiration of patients with cardiac disease, the mechanical factors in the production of dyspnea in cardiac disease, the relationship between vital capacity and dyspnea and between the size of the thorax and of the volume of the lung. Christie and Beams employed spirometry in the study of the relationship of position to orthopnea. The practical value of these studies seems to be found in the conclusions especially regarding emphysema and diseases of the heart. Hoover expressed the belief that in emphysema the patient suffers from impaired alveolar ventilation of the lung and not from impairment of the lung as the organ of external respiration.

Peabody developed the generalization: "Patients with cardiac and cardiorenal disease, who are without acidosis as indicated by the alveolar carbon dioxide tension react in a manner similar to normal subjects. Patients with cardiac and cardiorenal disease with acidosis are much more susceptible to the carbon dioxide in the inspired air. Dyspnea is more easily produced than in normal subjects or in patients without acidosis and the ventilation may be doubled when the inspired air contains only 2 or 3 per cent carbon dioxide." Not only was vital capacity indirectly involved in scientific studies of the respiration but it became very practically connected with the clinical study of heart disease, the evaluation of the stages of the disease, of progression and retrogression, of competency and incompetency. It became apparent that changes in vital capacity antedated any objective evidence of cardiac insufficiency such as pulmonary edema, enlargement of the liver or peripheral edema. The increase in vital capacity indicated improvement in cardiac competency before it could be appreciated by physical examination and a chart of many readings gave a graphic picture by which the clinician might see the whole course of the illness with respect to disturbance of the pulmonary circuit. No method in use at that time told so much about it as the determination of the vital capacity of the lungs.

Lilienthal, in 1926, in studying the comparative value of various operative procedures on the thorax, used vital capacity as an index of the crippling effect of these operations on respiration. He studied especially the vital capacity following lobectomy, and concluded that the ability to work or to exercise violently depended more on the condition of the heart than on vital capacity and thought there were far too many variations and individual differences affecting the readings to make them very important. He concluded: "From the surgeon's point of view, a reading approaching normal should not be considered as important as the elimination of the signs of disease for which the patient sought aid."

Powers, in 1928, studied the significance of vital capacity in relation to postoperative pulmonary complications. He believed that the greatest reduction of vital capacity, and the most prolonged period of recovery, followed operations on the upper part of the abdomen and he suggested that this excessive reduction in vital capacity might have some bearing on the frequency with which postoperative pulmonary complications occur after operations in this region.

Spirometry and Surgery.—The most important contributions of spirometry to surgery began in 1918, with the work of Graham and Bell, whose classical study of open pneumothorax, and its relation to the treatment of acute empyema, was the stimulus required to alter the whole plan of procedure in the surgical treatment of pleural exudates of synpneumonic type and of streptococcal origin. As a corollary of this epochal work in treatment, they were able to state general principles dealing with the risk of operation, the degree of dyspnea, and the accompanying cyanosis. These principles were to the effect that danger of operation increased in the proportion that vital capacity was reduced to the amount of the tidal air, which is the amount required to maintain aeration of the blood.

Yates, in 1925, studied vital capacity in relation to intrathoracic treatment and virtually confirmed the work of Graham and Bell. He stated: "Limitation in any of the four factors, volume of ventilated air, total expanse of alveolar epithelium, total area of vascular endothelium or unit volume of good blood, reduce the essential function, external respiration, which is manifested by corresponding reduction in vital capacity." He expressed the belief that accurately controlled observations of vital capacity of surgical patients, before and after operation, serve as a satisfactory criterion of their general postoperative condition.

Lemon and Moersch, in 1924, studied the converse of this problem; namely, the vital capacity in relation to operative risk. In view of the fairly accurate estimation which vital capacity gives of physical fitness, it seemed possible that operative risk might be estimated by the same method. They examined 379 consecutive patients before operation, compared the observations with the outcome of the operation, made a corresponding comparison with the surgeon's estimation of operative risk, and concluded: "For routine purposes, the determination of the operative risk from the surgeon's opinion is probably on the whole a more satisfactory estimate than that obtained by means of the vital capacity readings. However, if the surgeon does not have the benefit of experience or the assistance of an experienced internist in making such an estimate, especially in questionable cardiac or pulmonary conditions, vital capacity determinations may be of the greatest aid. From whatever cause, the closer the approximation of vital capacity to tidal air, the graver will the risk become."

Re-opening of investigation regarding the measurements necessary to create normal standards.—When Dreyer's book appeared in England, in 1920, the whole question of standard measurements was reopened. This study was the first real attempt to correlate all the important and accepted determining factors, such as, height, stem height, weight, age, sex and surface area. The other investigators who took part in this work included West, Lundsgaard and Van Slyke, Lundsgaard, Schierbeck, Stewart, Myers, Peabody, Boynton, Rogers, Lemon and Moersch, Jackson and Lees, and Swan and Evans.

Moersch and I have been impressed with the comparative accuracy of all the methods suggested. We believe that no single standard is applicable to all the variable factors. In that respect, we think the test is comparable to such functional tests as the test for renal sufficiency with phenolsulphonphthalein, or the various tests of hepatic function. We are also of the opinion that series of readings are more important than a single reading and that the discrepancies become of less significance if one standard is uniformly applied. For practical use, and for simplicity, one may employ the method and the tabulated data of Myers, or the slightly more bothersome calculation of West's formula. There seems to be a more nearly uniform opinion that West's formula, which includes the three great determining factors of height, weight and sex, is the most accurate. West found that the average vital capacity of young men is approximately 2.5 liters for each square meter of body surface, and that that of young women is approximately 2.0 liters for each square meter. Moersch and I thought that the vital capacity could be calculated more accurately by this formula than by any other method. West's second formula (height in centimeters multiplied by twenty-five for men and by twenty for women) seemed to us to be a satisfactory working formula, although slightly less accurate than the former. The method of Peabody and Wentworth was next in order of accuracy.

In any of these estimations, allowance must be made for age. A guide to the influence of age may be had from the work of early authors, especially of Hutchinson, and particularly from the long continued observations of Pratt, who found that vital capacity reaches its maximal amount in the third decade of life, and falls slightly in the fourth, but that no considerable reduction occurs before the age of sixty years. Bowen, in 1923, studied the relation of age and of obesity to vital capacity. He found that the vital capacity is within normal limits up to the age of fifty years; thereafter reduction is gradual and reaches 50 per cent of normal at the age of eighty-five years. The greatest drop is between fifty and sixty years. The vital capacity of people who are obese and overweight is but slightly less than normal, using the standard of height, but averages 20 per cent less than normal on the basis of surface area, between the ages of twenty-six and fifty. One of the most important studies had to do with estimations of vital capacity of children. Present knowledge in this field is largely dependent on the work of Emerson and Green who found that a close relationship exists between the vital capacity and surface area in childhood, that the vital capacity of girls is generally larger than that of boys, and that determinations of vital capacity of children who are less than seven years of age are unreliable.

Edwards and Wilson expressed their thought that the vital capacity of children exhibited slightly better correlation with height than with weight or surface area.

Stewart studied the vital capacity at various ages and traced the relative increase in both boys and girls as they grew toward maturity. He made an important observation that the increase in vital capacity becomes rapid about the time of puberty, and then proceeds at a slower rate, reaching its maximal amount near the twentieth year in the boy's life and slightly before this time in the girl's life. The period of acceleration in the rate of growth in pulmonary capacity begins and terminates at an earlier age with girls than with boys.

The report of Stiles and Graves is not unlike that of Stewart. Stiles and Graves found that there is an annual average increase in the pulmonary capacity, from the age of six years to that of seventeen years, and that this increase becomes especially marked from the age of fourteen years to that of sixteen years. The average pulmonary capacity, as measured by a dry spirometer, averages about 100 to 200 c.c. higher in boys than in girls from the age of six to thirteen years. At the age of fourteen years a very greatly increased difference in pulmonary capacity becomes evident in favor of the boys, and this difference increases between the ages of fourteen and seventeen years inclusive. At the age of seventeen years, the difference between boys and girls is marked. Stiles and Graves also studied the effects of infestation with intestinal parasites of various kinds, including Ascaris, Lamblia, *Endameba coli* and whipworm; only patients with whipworm infestation suffered any appreciable decrease from normal vital capacity.

Stewart, and Stewart and Sheets, studied the influence of disease on vital capacity and the importance of the test in estimating both the progress of the disease and the degree of injury to both the lungs and the heart. Included in their survey were cases of tuberculosis, bronchitis, lobar pneumonia, bronchial asthma, and heart disease. The moderate reduction in vital capacity present among children who had tuberculosis or were suspected of having it, was thought to be due, in part, to their general malnutrition, and probably to the presence of enlargement of tracheobronchial lymph nodes. The former explanation seemed the more probable. The conclusions lead one to believe that the effects of tuberculosis or of changes that arouse suspicion of its presence are not unlike those in adults. Wilson, Edwards, and Liss in 1924 used spirometric readings as an aid to the diagnosis of tracheobronchial adenopathy in children between the ages of five and twelve years. They found a reduction in vital capacity of 15 to 42 per cent in this type of disease.

Stewart and Platou reported that 75 per cent of children have vital capacity equal to, or more than, 90 per cent of the average for persons of corresponding age and size. Only 25 per cent have readings 10 per cent below their estimated normal values. It is to this group that special study should be directed to eliminate cardiac or pulmonary disease. The pathologic changes brought about by these diseases immediately influence vital capacity of the lungs. The progress of the disease, with increasing or declining severity, may be traced by charting repeated spirometric readings.

Racial characteristics.—Smillie and Augustine, in 1926, studied the vital capacity of the negro. They were studying the problem of infestation with hook-worm among negro children, and one of the measurements employed in determining the physical fitness of these children was the vital capacity. They discovered that normal negro children had markedly lower vital capacity than white children of the same age, sex, and economic status. This difference was found to be so constant that it seemed to them to be a true racial characteristic. Although the negro has longer legs and a shorter trunk than the white person, yet they found that the vital capacity of the negro when calculated from surface area was not greatly different from that of the negro when calculated from standing height. When the vital capacity of negroes was calculated from sitting height, however, the result was much higher than when it was calculated from standing height or surface area. Smillie and Augustine expressed the belief that the low readings, calculated from surface area and standing height, were due to the shorter trunk of the negro. Even when calculated from sitting height, however, the readings were 15 per cent below those of comparable white people. They thought that the standard deviation and the coefficient of variation of both races are lowest when vital capacity is calculated from surface area. Because of the low vital capacity of negroes, there is the temptation to suggest that there may be a correlation between it and their susceptibility to respiratory disease, particularly to pneumonia and tuberculosis. Smillie and Augustine have no data to sustain such an assumption.

Turner and Aboushadid studied the vital capacity of Syrian women and compared it with that of English, American and German women. They found the values definitely lower among the Syrian women than among the controls. Mixed races had vital capacity more nearly corresponding with the controls. Studies by Foster on Chinese adults and by Nanagas and Santiago on adult Filipinos and Chinese also indicate that these races have smaller vital capacity than Caucasians.

Throughout the last decade, many observers have repeated the studies on vital capacity in the presence of disease, without adding any really new data to those general principles discovered by Hutchinson and those who followed his work before the beginning of the present century. Nor have any principles been added to those laid down by Peabody. An instructive observation was made by Arnett, in 1925. He found that in so-called neurocirculatory asthenia, no significant diminution of the vital capacity exists as it does in organic heart disease. This is in agreement with the work of Levine and Wilson, Adams and Sturgis, White, and others who have shown that the vital capacity is generally within normal limits among patients with an irritable heart.

Flagstad and Kollman studied the vital capacity in cases of deformity from scoliosis. They were impressed with the rarity of tuberculosis in these cases and with the frequency of cardiac disease. They found dyspnea, irregularity of cardiac action and hypertrophy of the heart in the severe cases, and believed that these patients suffered impaired health due to their deformity. The resistance, defense, growth and repair of the intrathoracic structures, as well as of the entire organism, are commensurate with vital capacity. Flagstad and Kollman expressed the belief that the vital capacity gave an index to the injury done and to the operative risk, especially of thoracic, spinal, and abdominal operations. If the vital capacity approaches 50 or 60 per cent of normal, operation should not be considered lightly. Reduction of vital capacity probably explains the shock that frequently follows operation on severely sick persons.

Within later years, Myers reopened the discussion of the value of the test of vital capacity in estimating the fitness of recruits to the Army. Dreyer pointed out its use in the British flying service and Schneider made use of the test with the American flying forces. Ferguson made some definite statements as a result of work in the American naval service. He expressed the thought that spirometry was largely without diagnostic value in heart disease, but that in pulmonary disease, particularly incipient or quiescent tuberculosis, very valuable evidence could be obtained. His results are worth repetition: "Review of the Naval Academy records showed that nineteen midshipmen had developed pulmonary tuberculosis since 1912; of these nineteen men, ten had spirometric estimations made within a year of the development of the disease; seven, or 70 per cent, of these ten men had spirometric readings below the minimum for their height, that is, below 90 per cent of the calculated normal. Those figures are all the more striking because at the time of the observation the men had chest examinations made by at least two experienced examiners and no evidence of tuberculosis was found."

The value of the test consists in focusing attention on a particular group of men. It does not replace physical examination or other accepted methods used in diagnosis.

Wittich and Polczak compared tests of breath-holding with vital capacity in health and disease. They found that the deviation from the standards set up by Stange and Sabrazes was approximately the same as the deviation from the standards of vital capacity, and that cardiac or pulmonary disease produced the same effect on the readings of either test. The group of tuberculous men and women showed definitely corresponding diminution of breath-holding and vital capacity and the values diminished notably as the disease advanced. They quoted the work of McMechan as follows: "The breath-holding test bore a definite and direct ratio to vital capacity as gauged by the spirometer, so that a normal breath-holding test would naturally suggest a normal vital capacity and any decrease or increase of the breath-holding interval would indicate a corresponding rise or fall in vital capacity. The vital capacity in cubic centimeters clinically is usually about 100 times the Stange breath-holding interval in seconds for males and the Sabrazes test for females."

The workers of the present century have been able to develop acceptable standards for estimating the normal vital capacity. They recognize that no single test can satisfy all the variable influences, any more than any single renal or hepatic test can give complete information regarding the functions of those organs.

The influences of disease and race on the vital capacity have been confirmed, and the knowledge extended. The diagnostic and prognostic value has been more nearly agreed on, and the practical value of the test in both civilian and military practice has been established.

BIBLIOGRAPHY

1. Arnett, J. H.: The vital capacity of the lungs in relation to clinical medicine. Boston Med. and Surg. Jour., 193:157-162 (July 23), 1925.
2. Arnett, J. H., and Kornblum, K.: Vital capacity: An inquiry into its value as a diagnostic procedure. Ann. Clin. Med., 3:255-274 (Oct.), 1924.
3. Balfour, T. G.: Contribution to the study of spirometry. Tr. Medico-Chir. Soc. Edinburgh, 43:263-269, 1860.
4. Biegel, H.: On spirometry. Lancet, 1:119-120; 180-181, 1864.
5. Bell, J. W.: Vital capacity in pregnancy. Journal-Lancet, 44:424-426 (Aug. 15), 1924.
6. Bendove, R. A.: The vital capacity in artificial pneumothorax. The mechanism and factors modifying the vital capacity, with especial reference to its clinical and prognostic value in the collapse therapy. Arch. Int. Med., 36:94-120 (July), 1925.
7. Binger, C. A. L.: The lung volume in heart disease. Jour. Exper. Med., 38:445-476 (Oct.), 1923.
8. Blumgart, H. L., and Weiss, Soma: Clinical studies on the velocity of blood flow. The pulmonary circulation time, the velocity of venous blood flow to the heart, and related aspects of the circulation in patients with cardiovascular disease. Jour. Clin. Investigation, 5:343-377 (Feb.), 1928.
9. Blumgart, H. L., and Weiss, Soma: Clinical studies on the velocity of blood flow. The relation between the velocity of blood flow, the venous pressure and the vital capacity of the lungs in 50 patients with cardiovascular disease compared with similar measurements in 50 normal persons. Jour. Clin. Investigation, 5:379-392 (Feb.), 1928.
10. Bodkin, W. H.: Society of arts. Lancet, 1:390-391, 1844.
11. Bowen, B. D.: The relation of age and obesity to vital capacity. Arch. Int. Med., 31:579-589 (April), 1923.
12. Boyle: Quoted by Haldane, J. S.
13. Boynton, Ruth E.: Comparison of normal standards for the vital capacity of the lungs of women. Arch. Int. Med., 33:292-300 (March), 1924.

14. Burton-Opitz, R.: A new type of recording spirometer. Jour. Lab. and Clin. Med., 7:681-687 (July), 1922.
15. Campbell, J. M. H.: Weight, vital capacity, pulse rate before and after exercise, and physical fitness in health. Guy's Hosp. Rep., 75:263-285 (July), 1925.
16. Christie, C. D., and Beams, A. J.: The estimation of normal vital capacity with especial reference to the effect of posture. Arch. Int. Med., 30:34-39 (July), 1922.
17. Cooper, H. L., and Frank, L. A.: Vital capacity of lungs with special reference to prognosis in pulmonary tuberculosis. Colorado Med., 21:342-346 (Nov.), 1924.
18. Edwards, D. J., and Wilson, May G.: Analysis of some factors of variability in the vital capacity measurements of children. Arch. Int. Med., 30: 638-647 (Nov.), 1922.
19. Elsberg, L.: Pneumatometry; the new means of diagnosis in diseases of the respiratory organs. New York Med. Jour., 22:469-501, 1875.
20. Emerson, P. W., and Green, Hyman: Vital capacity of the lungs of children. Am. Jour. Dis. Child., 22:202-211 (Aug.), 1921.
21. Ferguson, David: The vital capacity test. U. S. Nav. Med. Bull., 23:329-348 (Nov.), 1925.
22. Flagstad, A. E., and Kollman, Sara: Vital capacity and muscle study in 100 cases of scoliosis. Jour. Bone and Joint Surg., 26:724-734 (Oct.), 1928.
23. Gleitsmann, W.: The spirometer—its value and utility to life companies. Med. Rec., 9:555-556 (Oct. 15), 1874.
24. Graham, E. A.: Some principles involved in the treatment of empyema. Surg., Gynec. and Obst., 31:60-71 (July), 1920.
25. Graham, E. A., and Bell, R. D.: Open pneumothorax; its relation to the treatment of empyema. Am. Jour. Med. Sc., 156:839-871 (Dec.), 1918.
26. Haldane, J. S.: Respiration. New Haven, Yale Univ. Press, 1922, 427 pp.
27. Hammond, G. M.: On the proper method of ascertaining the chest expansion by measurement. Med. Rec., 47:380-381 (March), 1895.
28. Hodges, A. B.: The value of vital capacity estimations in the study of heart disease. Virginia Med. Month., 55:315-318 (Aug.), 1928.
29. Holden, Edgar: A practical pneumatometer. Med. Rec., 13:438 (June), 1878.
30. Hooke: Quoted by Haldane, J. S.
31. Hoover, C. F.: The minute volume and alveolar air in pulmonary emphysema. Arch. Int. Med., 11:52-65 (Jan.), 1913.
32. Hunter, F. T.: The influence of position on the vital capacity and percentage of supplementary air in normal persons and in patients with large spleens. Boston Med. and Surg. Jour., 193:252-254 (Aug. 6), 1925.
33. Hutchinson, John: Lecture on vital statistics, embracing an account of a new instrument for detecting the presence of disease in the system. Lancet, 1:567-570; 594-597, 1844.
34. Hutchinson, John: On the capacity of the lungs and on the respiratory functions, with a view of establishing a precise and easy method of detecting disease by the spirometer. Tr. Medico-Chir. Soc. Edinburgh, 29:137-252, 1846.
35. Hutchinson, John: Obituary. Lancet, 1:240, 1862.
36. Jackson, C. M., and Lees, H. D.: Correlations between vital capacity and various physical measurements in 100 healthy male university students. Am. Jour. Physiol., 87:654-666 (Jan.), 1929.
37. Joannides, M.: The effect of dyspnea variously produced on the vital capacity of the lungs. Arch. Int. Med., 33:145-154 (Jan.), 1924.
38. Jones, Joseph: Vital capacity of the lungs and the vacuum pneumatic spirometer. Jour. Am. Med. Assn., 11:11-13 (July 7), 1888.
39. Lavoisier and Laplace: Quoted by Haldane, J. S.
40. Leas, R. D.: Vital capacity: a study of the effect of breathing dry air. Arch. Int. Med., 39:475-487 (April), 1927.
41. Lemon, W. S., and Moersch, H. J.: Basal metabolism and vital capacity. Arch. Int. Med., 33:130-135 (Jan.), 1924.
42. Lemon, W. S., and Moersch, H. J.: Factors influencing vital capacity. Arch. Int. Med., 33:136-144 (Jan.), 1924.
43. Lemon, W. S., and Moersch, H. J.: Comparison of constants for the determination of vital capacity. Arch. Int. Med., 33:118-127 (Jan.), 1924.
44. Lemon, W. S., and Moersch, H. J.: Vital capacity in relation to operative risk. Arch. Int. Med., 33: 128-129 (Jan.), 1924.
45. Lewis, Thomas: On the vital capacity of the French giant, M. J. J. Brice. Brit. Med. Jour., 2: 297 (Sept. 16), 1865.
46. Lilienthal, Howard: Vital capacity following lobectomy. Arch. Surg., 12:286-287 (Jan.), 1926.
47. Lower: Quoted by Haldane, J. S.
48. Lundsgaard, Christen, and Schierbeck, Knud: Studies on lung volume. The absolute and relative size of the different lung volumes. Proc. Soc. Exper. Biol. and Med., 20:158-160, 1922-1923.
49. Lundsgaard, Christen, and Van Slyke, D. D.: Studies of lung volume. I. Relation between thorax size and lung volume in normal adults. Jour. Exper. Med., 27:65-86 (Jan.), 1918.
50. McClure, C. W., and Peabody, F. W.: Relation of vital capacity of lungs to clinical condition of patients with heart disease. Jour. Am. Med. Assn., 69:1954-1959 (Dec. 8), 1917.
51. Mayow: Quoted by Haldane, J. S.
52. Meakins, J. C., and Christie, R. V.: Lung volume and its variations. Ann. Int. Med., 3:423-429 (Nov.), 1929.
53. Mitchell, S. W.: Improved spirometer. Am. Jour. Med. Sc., 37:378-379 (April), 1859.
54. Myers, J. A.: Studies on the respiratory organs in health and disease. VI. The significance of the vital capacity test in pulmonary tuberculosis, bronchial asthma, pneumonia and an acute infection outside the respiratory tract. Arch. Int. Med., 30: 648-667 (Nov.), 1922.

55. Myers, J. A.: Studies on the respiratory organs in health and disease. VIII. A method for quickly obtaining the percentage of an individual's theoretical normal vital capacity of the lungs. Am. Rev. Tuberc., 7:161-173 (April), 1923.
56. Myers, J. A.: Vital capacity of the lungs and its practical application. Jour. Indust. Hyg., 7:25-42 (Jan.), 1925.
57. Myers, J. A.: Studies on the respiratory organs in health and disease. XIX. The significance of serial vital-capacity readings in the guidance of diagnosis and treatment of certain diseases of the chest. Am. Rev. Tuberc., 11:64-70 (March), 1925.
58. Myers, J. A.: The normal chest of the adult and the child, including applied anatomy, applied physiology, X-ray and physical findings. Baltimore, Williams and Wilkins, 1927, 193 pp.
59. Myers, J. A., and Cady, L. H.: Studies on the respiratory organs in health and disease. XVII. The vital capacity in 347 cases of disease of the bronchi. Journal-Lancet, 45:66-67 (Feb. 1), 1925.
60. Myers, J. A., and Rice, C. H.: The respiratory organs in health and disease. XVIII. The vital capacity of the lungs in chronic fibrous pleurisy, healed empyema and pulmonary tuberculosis both clinical and non-clinical. Arch. Int. Med., 35:557-560 (May), 1925.
61. Owen, L. J.: Measurements of the chest with the tape measure and spirometer. Mil. Surgeon., 26:-551-554 (May), 1910.
62. Peabody, F. W.: Clinical studies on the respiration. I. The effect of carbon dioxid in the inspired air of patients with cardiac disease. Arch. Int. Med., 16:846-864 (Nov.), 1915.
63. Peabody, F. W.: Clinical studies on the respiration. II. The acidosis of chronic nephritis. Arch. Int. Med., 16:955-966 (Dec.), 1915.
64. Peabody, F. W.: Clinical studies on the respiration. III. A mechanical factor in the production of dyspnea in patients with cardiac disease. Arch. Int. Med., 20:433-442 (Sept.), 1917.
65. Peabody, F. W.: The vital capacity of the lungs. In: Oxford Medicine. London, Oxford University Press, 1, pt. 1, 1920, pp. 417-427.
66. Peabody, F. W.: The clinical importance of the vital capacity of the lungs. Northwest Med., 22: 307-311 (Sept.); 350-353 (Oct.), 1923.
67. Peabody, F. W., and Wentworth, J. A.: Clinical studies on the respiration. IV. The vital capacity of the lungs and its relation to dyspnea. Arch. Int. Med., 20:443-467 (Sept.), 1917.
68. Peabody, F. W., Wentworth, J. A., and Barker, Bertha: I. Clinical studies on the respiration. V. The basal metabolism and the minute-volume of the respiration of patients with cardiac disease. Arch. Int. Med., 20:468-478 (Sept.), 1917.
69. Pepper, William: The spirometer; its use in detecting disease of the lungs. Am. Jour. Med. Sc., 25:297-312 (April), 1853.
70. Powers, J. H.: Vital capacity, its significance in relation to post-operative pulmonary complications. Arch. Surg., 17:304-323 (Aug.), 1928.
71. Pratt, J. H.: Long-continued observations on the vital capacity in health and heart disease. Am. Jour. Med. Sc., 164:819-832 (Dec.), 1922.
72. Rabinowitch, I. M.: The vital capacity in hyperthyroidism (based upon statistical study of two thousand two hundred observations). Boston Med. and Surg. Jour., 194:199-201 (Feb. 4), 1926.
73. Rogers, W. L.: The correlation of vital capacity with stem height. Arch. Int. Med., 31:342-344 (March), 1923.
74. Sanderson, J. B.: On a method of determining the quantity of air breathed in a given time and the proportion of carbonic acid contained in the expired air. Lancet, 2:540-541 (Nov. 28), 1857.
75. Schneevoogt, G. E., and Voorhelm: De practische, diagnostiche waarde van den spirometer. Tijdschr. d. Nederl., 1:1-48, 1850; Schmidt Jahrbuche. 80, 1853, pp. 359-360; Ztschr. f. rat. med., 5:9-28, 1854.
76. Shepard, W. P.: The effect of certain past diseases on vital capacity. Arch. Int. Med., 33:185-192 (Feb.), 1924.
77. Smillie, W. G., and Augustine, D. L.: Vital capacity of negro race. Jour. Am. Med. Assn., 87:2055-2058 (Dec. 18), 1926.
78. Stewart, C. A.: The vital capacity of the lungs of children in health and disease. Am. Jour. Dis. Child., 24:451-496 (Dec.), 1922.
79. Stewart, C. A.: A consideration of the extent of the normal variability of the vital capacity of the lungs of children. Am. Rev. Tuberc., 13:272-277 (March), 1926.
80. Stewart, C. A.: The vital capacity of the lungs of children having masked juvenile tuberculosis. Am. Rev. Tuberc., 13:278-283 (March), 1926.
81. Stewart, C. A., and Platou, E. S.: The lungs in infancy and childhood. Minnesota Med., 8:715-718 (Nov.), 1925.
82. Stewart, C. A., and Sheets, O. B.: The vital capacity of the lungs of children: a preliminary report. Am. Jour. Dis. Child., 24:83-88 (Jan.), 1922.
83. Stiles, C. W., and Graves, Floyd: Lung capacity of children. Spirometer tests of 1,618 white school children (751 boys, 867 girls), in the city of X[1]. Pub. Health Rep., 30:3067-3072 (Oct. 15), 1915.
84. Swan, J. M., and Evans, F. H.: Further observations on the Dreyer method for the determination of physical fitness. Mil. Surgeon, 60:442-448 (April), 1927.
85. Turner, E. L., and Aboushadid, Edma: The basal metabolism and vital capacity of Syrian women. Am. Jour. Physiol., 92:189-195 (Feb.), 1930.
86. Van Slyke, D. D., and Binger, C. A. L.: The determination of lung volume without forced breathing. Jour. Exper. Med., 37:457-470 (April), 1923.
87. West, H. F.: Clinical studies on the respiration. VI. A comparison of various standards for the normal vital capacity of the lungs. Arch. Int. Med., 25:306-316 (March), 1920.
88. Wilson, D. C.: Vital capacity determinations in persons with normal heart and lungs, above 40 years of age. Proc. Soc. Exper. Biol. and Med., 20:186, 1922-1923.

89. Wilson, May G., Edwards, D. J., and Liss, I. E.: Vital capacity as an aid in diagnosis of tracheobronchial adenopathy in children from five to twelve years of age: its significance in evaluation of vital capacity measurement of average normal children. Am. Jour. Dis. Child., 27:49-59 (Jan.), 1924.

90. Wittich, F. W., and Polczak, J. A.: A comparison of breath-holding tests with vital capacity in health and disease. Am. Rev. Tuberc., 13:54-61 (Jan.), 1926.

91. Yates, J. L.: The significance of vital capacity in intrathoracic therapy. Arch. Surg., 10:477-505 (Jan.), 1925.

IS VITAMIN A AN ANTI-INFECTIVE AGENT?

The significance of vitamin A as an essential of human nutrition can no longer be questioned. Until recently, physiologists have been engrossed with the consideration of the more obvious manifestations of deficiency disorders. The gross lesions of scurvy, pellagra, rickets and other results of dietary defects have received foremost consideration. When mastoid and nasal sinusitis, purulent otitis media, and ocular, respiratory and alimentary tract infections were found to occur in laboratory animals deprived of vitamin A, the problem of "lowered resistance" naturally presented itself. Recent investigation has suggested that infection may follow the weakening of the tissues, and that it may be due to the breakdown of the local tissue defenses. This has raised the question as to whether it is proper to refer to vitamin A as an "anti-infective" agent. Rats inoculated with virulent bacteria and kept on a vitamin A-free diet showed markedly decreased resistance to infection as compared with controls receiving cod liver oil. No such susceptibility to similar inoculations was found in rats on a diet deficient in vitamin D, compared to controls protected by viosterol. Increased susceptibility to infection is apparently an early manifestation of a dietary low in vitamin A. There has been a lack of evidence that vitamin A can cure infections when the barrier of the mucous membranes has been passed or that it can prevent or cure infections that enter the blood stream. The newer studies pave the way for the possibility, however, that vitamin A may after all do more than maintain the physiologic defenses of the mucous membranes. (Jour. A. M. A., October 24, 1931, p. 1229.)

THE SURGICAL TREATMENT OF ACUTE EMPYEMA*

Stuart W. Harrington, M.D.
Rochester, Minnesota

THE most common type of empyema is that which occurs as a complication of some primary pulmonary disease. Practically all cases of pulmonary infection are under medical supervision from the onset of the disease and those cases in which surgical intervention is required usually are the result of unavoidable complications that have developed during the course of the disease. The patients are very ill, for their resistance has been lowered by the primary pulmonary infection, and surgical treatment to alleviate the condition should be as conservative as possible.

The fundamental principle in the treatment of acute empyema is surgical drainage, but the time, site and method of drainage depend on the indications in the individual case. Many methods have been advanced for the accomplishment of drainage in these cases, but none has been entirely satisfactory in all cases, which explains the multiplicity of operative procedures. The majority of methods advanced differ only in details of technic. The cardinal principles of any method for cure of acute empyema are : (1) adequate drainage, (2) avoidance of open pneumothorax, (3) rapid sterilization of the diseased area, (4) early obliteration of the cavity by expansion of the lung, and (5) good medical care with particular attention to the nutrition of the patient.

Surgical intervention in these cases should be conservative, directed toward saving the patient's life, and toward restoring him to health in the shortest time, with the least loss of structure and function, and with a minimal amount of discomfort and deformity.

From an anatomic standpoint, acute empyema may involve the entire thoracic cavity, with complete collapse of the lung, or encapsulation may have taken place, and the empyema may be of the interlobar, parietal, mesial or diaphragmatic types. In these types of empyema, only a portion of the thoracic cavity is involved, and the lung is only partially collapsed. The condition may be unilateral or bilateral, and the encapsulated cavities may be single or multiple.

In cases in which physical signs, clinical symptoms, and roentgenologic examination give reason to suspect the presence of empyema, the first surgical procedure indicated is that of diagnostic aspiration of the thoracic cavity. This procedure should be carried out under the strictest observance of the laws of asepsis, and the patient should be prepared for a radical procedure if it should prove necessary. The site of election for the puncture is determined by the physical signs and roentgenologic examination. The usual site, in the total and large parietal types of empyema, is the eighth or the ninth interspace, in the posterior axillary line. If the fluid is thin and clear, or opalescent, no further surgical procedure should be performed at the time, except when there are signs of cardiac or respiratory difficulty from pressure of a large amount of fluid; then from 500 to 750 c.c. of fluid may be removed, thus completing the procedure as a therapeutic aspiration. A culture of the fluid removed should be made and the type of bacterial invasion determined; this is of prognostic importance but has no direct bearing on the subsequent operative procedures except in cases of tuberculous empyema. If pyogenic organisms are not found, either by smear or culture, surgical drainage of the pleural cavity should not be instituted, regardless of the clinical symptoms or of the gross appearance of the fluid aspirated, because of the possibility of the condition being a tuberculous effusion. When anaërobic organisms are found, great care should be exercised not to contaminate the thoracic wall, because of the possibility of producing severe gangrenous infection.

The types of bacteria which more commonly invade the lungs are the pneumococcus and the streptococcus. Of the streptococci, those of the hemolytic type are especially noteworthy. The pneumococcic type of empyema is likely to occur late in the course of the pulmonary disease, during the process of healing, and there is a tendency to early formation of fibrin and frank pus, with thickening of the pleura. The hemolytic streptococcus types of empyema usually occur early in the course of the pulmonary disease, and the formation of fibrin and frank pus, with thickening of the pleura, is less rapid. This type presents the greatest surgical risk because the empyema is present when the toxemia of the pulmonary disease is greatest.

---

*From the Division of Surgery, The Mayo Clinic, Rochester, Minnesota. Read before the Minnesota State Medical Association, Minneapolis, May 4 to 6, 1931.

During the acute, seropurulent stage of empyema, aspiration should be performed as often as necessary to relieve cardiac and respiratory difficulty. Gradual transition of the fluid, from a clear, thin appearance, to an opalescent, thick aspect, will be observed, and finally frank pus will be obtained, at which time surgical drainage is indicated.

Repeated aspiration rarely effects cure, although it may be curative occasionally in hemolytic streptococcal types. However, repeated aspiration is of great aid in tiding the patient over the critical period of the illness, until the pneumonic process is healing, and fibrinous thickening of the visceral pleura has stabilized the mediastinum. Operative drainage by one of the closed methods can then be accomplished with greater safety.

The method of choice for surgical drainage is a matter of personal experience. I have obtained the best result from the intercostal closed method and from the transcostal closed method, in the latter of which the dressing tube is inserted through the inner layer of periosteum, after resection of a small segment of a rib. The site of drainage is determined with an aspirating needle, a trocar and cannula of the desired size are inserted through the selected interspace, and a catheter the exact size of the cannula is inserted through the cannula, which is then withdrawn. In this way the drainage tube fits the opening in the thoracic wall as accurately as possible. The tube has an opening at the end, and another at the side, and enters the empyema cavity for not more than half an inch, thus preventing injury to the pulmonary tissue when the lung reëxpands to fill the cavity, and also avoiding mechanical irritation as a contributing cause of thickening of the pleura. The tube is clamped and securely fastened to the thoracic wall with adhesive tape, making an air-tight closure. The pus is aspirated with a syringe, and the cavity is irrigated at first with physiologic sodium chloride solution. Then, if a bronchial fistula is not present, 0.5 per cent chlorinated soda (Dakin's solution) is used to aid in sterilizing the cavity, in liquefying the fibrin and to act as a chemical decorticant. This procedure is carried out every hour in the course of the day and every two or three hours at night. The patient is immediately started on respiratory and blowing exercises to reëxpand the lung and to obliterate the cavity. The vital capacity is estimated daily to determine the progress of the reexpansion of the lung. A specimen of the drained material is taken for culture, and the capacity of the cavity is measured once a week.

The kind of solution used to irrigate the cavity is a matter of choice and experience. Many solutions act better in the test tube than in contact with tissue. I have tried the different solutions, and recently have studied three parallel series of cases; in one series I used mercurochrome, in a second, physiologic solution of sodium chloride, and in the third, 0.5 per cent chlorinated soda. It is difficult to make any definite decision relative to the merits of each. I believe that there is very little antiseptic value in the solutions used, and that the efficiency of the irrigation method lies in the mechanical washing out of the pleural exudate. Because I have employed the solution of chlorinated soda for a longer time, I may be prejudiced in its favor. Its greatest value in obliterating the cavities consists in its proteolytic properties and in its mechanical action on the tissues; thus the period of drainage and of convalescence is shortened. It must be used in strength so that 0.45 to 0.5 per cent of free chlorin, the active agent of the solution, is available and it should be prepared fresh. I use a solution of hyclorite, a proprietary preparation, which is about eight times normal strength, is more stable than 0.5 per cent chlorinated soda, and does not have to be prepared so often. It is prepared for use by mixing one part of the hyclorite solution with seven parts of distilled water. It is not only bactericidal but lytic in action, and, therefore, is of great value in cases in which the closed method of drainage is used, and in which there are masses of fibrin in the pleural exudate. Hyclorite cannot be used in cases of pleurobronchial fistula in which drainage has been accomplished by the closed method because it gives rise to irritative cough. In these cases, irrigation with solution of sodium chloride is carried out until open drainage can be instituted; then the solution of chlorinated soda can be used if the fistulas are plugged.

Great care should be exercised in maintaining nutrition and body fluids of these patients. They should be given a diet of high calorie value, averaging from 3,000 to 3,500 calories a day, with a liberal intake of fluid.

The intercostal, closed method of drainage is not a new method, for the underlying principle was first advocated by Bülau and was reported in 1891. The method described is a modification, with many changes in detail and subsequent treatment. In some cases the drainage may be interfered with by plugging of the tube with masses of fibrous material from the pleural exudate. This material usually can be dislodged by suction on the tube with a syringe. Occasionally there is leakage around the tube, but as a rule this does not take place for a week or more, by which time the patient has been carried over the dangerous period and marked reëxpansion of the lung has taken place. Then open drainage by costal resection can be instituted with greater safety. In the majority of cases there is no technical difficulty with drainage and irrigations, and the size of the cavity gradually decreases. This decrease is most marked in the first week or ten days, after which reduction is much slower.

When the capacity of the cavity has been reduced to 50 c.c. and very little progress occurs after two or three weeks, an open operation is performed, involving resection of one or two ribs. The residual cavity is allowed to heal by granulation, and is packed twice a day with gauze saturated in hyclorite solution, or if the cavity is large enough tubes are inserted for irrigation with hyclorite solution.

If the cavity continues to contract under the closed method of treatment, the tube is gradually shortened until the cavity is entirely obliterated. This can be done in 60 to 70 per cent of the cases, but there is danger of recurrence, and if there is a return of symptoms a tube should be reinserted immediately. It is probably a safer procedure to change to open drainage after practically complete reëxpansion of the lung has taken place, and only a small residual pocket remains, particularly if the patient is not under observation daily.

I recently reviewed seventy-one cases of acute empyema in which I have operated in the last five years (tabulation). The infecting organism in thirty-two cases was the pneumococcus Type I, in five cases the pneumococcus Type II, in three cases the pneumococcus Type III, and in one case the pneumococcus Type IV. In twenty cases the streptococcus was the infecting organism, and in seventeen of these it was of the hemolytic type. Intercostal, closed drainage was

SURGICAL TREATMENT AND RESULTS IN SEVENTY-ONE CASES OF ACUTE EMPYEMA

Types of infection	Cases
Pneumococcus Type I	32
Pneumococcus Type II	5
Pneumococcus Type III	3
Pneumonococcus Type IV	1
Hemolytic streptococcus	17
Streptococcus	13

Types of operation and mortality	Cases	Healed without subsequent operations	Subsequent open operations necessary	Deaths
Intercostal closed drainage	34	20	14	4
Transcostal closed drainage	32	24	8	
Repeated aspiration (streptococcal infection)	5	2	3	
Total	71	46 (65%)	25 (35%)	4

Data on cases in which death occurred

Cases	Age, Years	Diagnosis	Operation	Days after operation, when death occurred	Cause of death
1	65	Right streptococcal empyema	Intercostal closed drainage	29	Meningitis; myocarditis; right bronchopneumonia
2	29	Left streptococcal empyema	Intercostal closed drainage	9	Mitral endocarditis with stenosis; bilateral bronchopneumonia
3	5	Right hemolytic streptococcal empyema	Intercostal closed drainage with subsequent open operation 23 days later	40	Fibrinous pericarditis and mediastinitis; bronchopneumonia
4	1	Bilateral pneumococcus Type II empyema	Intercostal closed drainage on left side; eight days later, intercostal closed drainage right side	44	Acute serofibrinous hemorrhagic pericarditis

used in thirty-four cases. Of these, healing was complete in twenty in from three to six weeks, without further operative treatment. In fourteen cases, it was necessary to perform a minor open operation, removing a small segment of from one to three ribs to hasten obliteration of a small residual sinus or cavity holding from ½ to 1 ounce (15 to 30 c.c.). In thirty-two cases the transcostal type of closed drainage was done, in twenty-four of which healing took place without further operation and in eight of which subsequent open operation was required to obliterate a small residual cavity. Repeated aspirations were performed in five cases of streptococcal empyema, and in three of these subsequent open operation was required. In the two cases in which healing took place the infection was of the hemolytic streptococcal type. The most common causes for failure of complete obliteration of the cavity by the closed method were the presence of pleurobronchial fistula, and thickening of the visceral and parietal pleura, with fixation of the lung as a result of delayed drainage. In a few cases in which it was impossible for patients to remain under observation, an open operation was done for a small residual sinus, because of the possibility of retention of seropurulent exudate in the small sinus tract. Such retention may cause recurrence of the empyema.

There were four deaths from operation in the entire series. One patient, sixty-five years of age, died from myocarditis, meningitis, and bronchopneumonia twenty-nine days after operation. The infecting organism was a green-producing streptococcus. A second patient, twenty-nine years of age, who had bilateral pneumonia, died nine days after institution of drainage for empyema which developed on the left side and the infecting organism of which was a green-producing streptococcus. The cause of death in this case was mitral endocarditis, with stenosis, and bilateral bronchopneumonia. A third patient, five years of age, died forty days following institution of drainage for postpneumonic empyema of the right side, with pulmonary abscess. The cause of death was fibrinous pericarditis, mediastinitis, and bronchopneumonia, and the infecting organism was a hemolytic streptococcus. The fourth patient to die was a child, one year of age, who died forty-four days after institution of drainage for bilateral empyema, following pneumonia in the course of which pneumococcus Type II was found. The left side was drained first and the intercostal closed method was used. The right side was aspirated for eight days before intercostal drainage was instituted on that side. The cause of death was acute serofibrinous hemorrhagic pericarditis.

The number of deaths, three, was greatest among the cases of streptococcal empyema; among the patients with the pneumococcus type of empyema there was one death. All of the patients who died were extremely ill and death was not due to the empyema or to the type of treatment instituted for relief of the empyema, but was the result of lack of resistance against the primary infecting organism.

Forty-nine patients recently replied to letters of inquiry. In two cases the wound has not healed because of bronchopleural fistula. In one of these cases, six months has elapsed since operation. The cause of the empyema in this case was a pulmonary abscess which had ruptured into the pleural cavity. In the second case, seven months has elapsed since operation. This patient had interlobar empyema, with multiple bronchopleural fistulas. In forty-seven cases the patients were entirely relieved of symptoms, and the wounds had healed.

Inasmuch as chronic empyema is the result of gradual development from the acute condition, over a period which may be arbitrarily taken to be two or three months, it would seem that if all the factors which lead to chronicity could be anticipated, recognized, and obviated during the treatment of the the acute condition, there would not be any chronic stage, and complete healing would result. However, it is manifest that this uniformity of cases and perfection of treatment cannot exist, and in many cases chronicity is unavoidable from the onset. Such cases are those in which the etiologic factor is tuberculosis, actinomycosis, secondary involvement of the thorax from a subdiaphragmatic amebic infection, or a degenerating malignant growth with secondary infection, rupturing into the pleural cavity.

The majority of cases seen at The Mayo Clinic are of the chronic type. In reviewing the factors which led to the development of the chronic condition in these cases, it was found that the most common were incomplete drainage, collapse of the lung, secondary encapsulated cavities, pleurobronchial fistulas, foreign bodies such as drainage tubes and bismuth in the cavity, formation of calcium deposit in the empyema cavity, and osteomyelitis of the ribs as a result of secondary infection of the thoracic wall. The treatment of these cases is essentially surgical, and the operative procedure is of much greater magnitude than in the treatment of acute conditions. This emphasizes the importance of proper treatment during the acute stage of the disease.

SUMMARY

The most common types of empyema are those which occur as complications of pneumonia of pneumococcal or streptococcal etiology. The treatment of acute empyema is surgical drainage, the guiding principle of which is to be as conservative as is consistent with effectual treatment. Seventy-one cases of acute empyema are the basis of this report. Intercostal closed drainage, transcostal closed drainage, and repeated aspirations were the types of surgical treatment used. In forty-six cases (65 per cent), healing took place without open operation. In twenty-five cases (35 per cent), subsequent open operation was required, for obliteration of the small residual empyema cavity. There were four deaths in the entire series, or an operative mortality of 5.6 per cent.

THE A. M. A. CHEMICAL LABORATORY

The A. M. A. Chemical Laboratory cannot analyze specimens for individuals. 1. The chemical work undertaken by the Laboratory must be of *general* interest to physicians. 2. The laboratory is busily engaged in the work for which it was founded, namely, investigations of the newer remedies for the Council on Pharmacy and Chemistry. 3. The Laboratory undertakes examination only of products in original containers, bearing original labels and the source of which can be vouched for in case of possible court action. 4. The present Laboratory would need much enlargement and a far larger staff to examine specimens for all of the one hundred thousand physicians it is designed to serve. (Jour. A. M. A., October 3, 1931, p. 1001.)

NEW AND NON-OFFICIAL REMEDIES

There is no better way of keeping up to date on the newer remedies than to follow the work of a competent, unbiased group of scientific investigators, working altruistically in the interest of the medical profession. The Council on Pharmacy and Chemistry is such a group. New and Non-official Remedies is its list of accepted products. The book is published annually and describes accepted articles and includes facts the physician should know. It keeps physicians up to date regarding the newest remedies. It advises physicians of products not worthy of their attention. It is useful to the physician when he is importuned by the detail man to prescribe a new specialty. (Jour. A. M. A., September 5, 1931, p. 707.)

TRAUMATIC ABDOMEN*

Roy F. Raiter, M.D.
Cloquet, Minnesota

To the general practitioner or surgeon practising in an industrial section where the treatment of accidental injuries makes up a large part of his practice, the subject of traumatic injury of the abdomen is a very important one.

In this paper I shall confine myself to a discussion of the non-penetrating injuries, since the diagnosis and treatment of penetrating wounds are in most cases fairly obvious.

The importance of early diagnosis is evident for examination of reported cases reveal a mortality of 40 per cent in those cases operated upon within twenty-four hours after the injury.

The industrial surgeon seeing the patient who has received an abdominal injury must, if he is to successfully treat this patient, in a very limited time, quickly determine if the injury sustained is merely a contusion without visceral injury and which requires conservative treatment, or whether an intra-abdominal organ has been injured, requiring immediate and not delayed surgical interference. He must depend principally in the majority of cases on the history of the case and manner of injury, on what he can see and feel, and without the special aids, such as X-ray, the laboratory and so forth. In some of these cases, early diagnosis is extremely difficult, and after repeated examinations at short intervals, if symptoms and signs, as I shall mention persist, it is safer to operate in these doubtful cases.

A study of the reported cases reveals some striking facts about abdominal injuries.

1. Injuries of the liver and spleen are more common than injuries of the hollow viscera, such as the stomach, the intestine, and the urinary bladder.

2. The predominant objective symptoms in injuries of the solid or parenchymatous organs are early severe shock and hemorrhage, which cause death very early, often within a few hours, while in contrast to this, these factors or symptoms are not nearly so common in injuries of the stomach, intestines and urinary bladder.

3. A smaller proportion of patients with injury to their hollow viscera die of intra-abdominal hemorrhage and shock. In these cases death usually occurs at a later time and more often from an acute suppurating peritonitis which results from leakage of the contents into the abdominal cavity.

The reason for this relative infrequency of injury to the hollow viscera is probably due to the difference in their anatomical location and structure. The stomach is protected to a great extent by the lower ribs; the colon is lying on a cushion of small intestines, and their greater mobility enables them to more easily escape injury. While on the other hand the solid or parenchymatous organs are less free to move and their friable consistency makes them more susceptible to rupture. The urinary bladder is also protected from injury by the bony pelvis and is in danger of rupture only when in a state of full distention.

There are some general symptoms common to all of the abdominal injuries, and specific ones which present themselves according to the individual organ or structure involved.

Of the general symptoms and signs we find abdominal pain (local or generalized), shock, tenderness and abdominal rigidity common to all. A patient with serious abdominal injury commonly presents symptoms of shock, the pulse is rapid and of small volume, the temperature is subnormal, and vomiting often occurs, almost invariably in cases of intestinal rupture. Early, however, the temperature and pulse are not reliable symptoms because of the shock immediately following such injuries. Later on, with the reaction from the shock, a rising temperature and pulse and persistence of vomiting are sufficient to demand an exploration. No one single symptom or sign of visceral injury can be considered pathognomonic.

Tension of the abdominal wall is perhaps the single most important of the objective signs of an organic lesion within the abdomen, and its presence, if persistent, justifies immediate surgical intervention. This muscle tension may be circumscribed or boardlike rigidity of the entire abdomen while in a mere contusion of the abdominal wall it is rarely present, and, if present, lasts only a short time. This rigidity appears immediately after the injury and does not yield to morphine, and is the most significant of the objective symptoms.

---

*Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

Obliteration of liver dullness is an important sign in that it aids in differentiating between intra-abdominal hemorrhage and a rupture of a hollow viscus.

Free air in the abdominal cavity, demonstrable by fluoroscopic examination, is an almost constant sign of a ruptured hollow viscus such as the stomach or intestine.

Costal breathing is often characteristic of these cases. The patient should be carefully observed while in repose and if the abdominal wall is immobile while the thorax responds to deep breathing, an organic lesion within the abdominal cavity is probable.

Grassman's sign or sensitiveness of the Douglas pouch is a valuable aid in the diagnosis of injury to the abdominal organs but it is usually not positive until late and in many cases may be absent.

As before mentioned, the usual result of injury to the parenchymatous or solid organs is marked shock and profuse internal hemorrhage. One of the most commonly injured of these organs is the liver. It is much disposed to injury on account of its size, consistency and fixation.

Ruptures of the liver are of two varieties: (1) true rupture in which the capsule and parenchyma are torn; (2) subcapsular ruptures in which the lesion is produced below the intact capsule. Subcapsular ruptures are much more rare than the true variety, and it is this latter variety which gives rise to severe intra-peritoneal hemorrhage.

Graham gives three reasons why hemorrhage from the torn liver is so severe.

1. Liver blood mixed with bile coagulates slowly.
2. The hepatic blood vessels have fewer vasomotor fibers than the vessels of the other organs.
3. The diaphragmatic movements cause a continued blood pressure variation.

For these reasons spontaneous hemostasis in liver injuries is rare.

Symptoms of ruptured liver are those of internal hemorrhage and shock, abdominal rigidity, diffuse abdominal pain which often radiates to the shoulders and dullness in the flanks if the hemorrhage is severe.

In the treatment of liver ruptures one should be guided by the amount of hemorrhage. Few of these cases can be treated conservatively, and the safest procedure is operation, either suturing the tear or packing, which is the quickest and most simple. Other methods like cautery and compression of the hilus and ligation of bleeding points are time consuming and more difficult.

An illustrative case of liver injury.

A man, aged 48, was brought into the hospital at about ten in the morning from a saw mill where he had a few minutes previously been struck in the upper abdomen by a kick-back board. He was in great constant pain, marked shock, with a rapid pulse, and had an anxious facial expression, extreme rigidity of the entire abdominal wall, costal breathing and marked upper abdominal tenderness. A diagnosis of the liver or intestinal perforation was made and he was operated two hours after entrance to the hospital. A tear along the falciform ligament was sutured with a blunt needle and the hemorrhage stopped. A drain was inserted and the abdomen closed. Convalescence was uneventful and he was discharged sixteen days later.

One point worth mentioning is that in suddenly opening an abdomen in which there is a bleeding organ such as the liver or spleen, sudden release of intra-abdominal pressure may cause a renewed profuse hemorrhage where hemostasis has partially taken place.

Injuries of the kidneys vary from a simple contusion to a complete tear of the kidney parenchyma. Hematuria is the usual and most constant symptom with pain in the loin, spasm of the lumbar muscles, and sometimes abdominal rigidity. Although some of the severest ruptures manifested by continued intense hematuria and signs of internal hemorrhage, occasionally call for a nephrectomy, even the largest perinephritic hematoma will often be absorbed or at the most require incision if it becomes infected.

A patient illustrating an example of moderate kidney injury was brought into the hospital after a car collision.

The patient stated that he had been forcibly thrown against the arm rest in the rear seat of the car. He complained of pain in the loin which was constant. He was passing bood-stained urine and was tender to palpation only on the affected side in the loin. He was not in shock, the pulse rate was about normal, and he had no other symptoms. He was put to bed and given morphine, and continued to pass blood in the urine in decreasing amount for two days. The pain and tenderness gradually lessened and patient was discharged on the tenth day.

The urinary bladder is injured more commonly in men, probably because of more frequent exposure to violence. The tear may be extra- or intra-peritoneal. The former can give rise to a spreading pelvic cellulitis, the latter causing a pelvic peritonitis. The extra-peritoneal are almost invariably associated with fractures of the pelvic bones, while the intra-peritoneal are caused by contusion to the anterior abdominal wall when the bladder is distended.

Injury to the bladder is evidenced or characterized by a constant desire to urinate, but the patient is able to pass only a few drops of blood-stained urine. Catheterization most always yields a small amount of bloody urine. When an injection is made into the bladder of a measured amount of sterile water, the amount returned will usually be less, unless the tear in the bladder is very large and the catheter passes through the bladder into the abdominal cavity, when the return may be much greater than the amount injected. Ruptured bladders should be repaired immediately and drainage instituted.

The following case report is that of a federal prisoner who fell out of a top bunk in his cell onto the cement floor, landing on his abdomen. He was brought into the hospital shortly after. He was in moderate shock, complained of constant burning pain over the lower abdomen with a constant desire to urinate. Muscle rigidity was present over the entire abdomen, more marked over the lower half. A catheterized specimen yielded only a small amount of almost pure blood although he stated that he had taken several glasses of water two hours before and had not voided since. A diagnosis of ruptured bladder was made. He was operated on about two hours after entrance to the hospital. The lower abdomen and pelvis were filled with a large amount of bloody urine. A tear about one inch long was found in the posterior wall of the bladder. The hemorrhage had stopped by this time. The rent in the bladder was repaired, a retention catheter was placed in the bladder, a drain in the free pelvis and the abdomen was closed. After running a stormy course for one week with a moderately severe peritonitis, his condition improved and he was discharged one month later.

In the intestinal injuries, hemorrhage is usually not so common a factor unless the mesentery is torn, when bleeding can be very severe. Shock may or may not be present, vomiting is almost always present, pain is usually present, as is also abdominal rigidity, and these, if persistent and increasing, together with obliteration of liver dullness following a history of injury to the abdomen, are very important in the diagnosis of intestinal rupture. Shock, which is so early a symptom in liver and spleen injuries, is often absent in intestinal injuries. Rising pulse, increased temperature and abdominal distention are of value only later when peritonitis develops.

Case reports show that early operation for intestinal and stomach injuries is the best method of treatment. If the perforation is small, closure is not difficult, while, with larger openings and tearing of the mesentery, resection of part of the bowel may at times be necessary.

A case quite typical of above was recently observed. A male, aged 46, was admitted to the hospital at 11:45 A. M. He had been struck a sharp blow over the lower abdomen by a spring lever. He complained of severe abdominal pain, vomited several times, and was in moderate shock. The pulse was slightly elevated but strong, his temperature normal. The entire abdomen was tense, the liver dullness not obliterated, and Grassman's sign was absent. With persistent muscle rigidity, continued vomiting and increasing abdominal pain, operation was decided upon three hours later. Upon opening the abdomen through a lower midline incision, the abdominal cavity was found to be badly soiled with intestinal contents. There was a small amount of blood and a beginning peritonitis. In the lower ileum about six inches from the ileocecal junction, a single perforation was found. The rent in the bowel was closed, free fluid and intestinal contents sponged out as well as possible, drains inserted and the abdomen closed. The patient died on the sixth day following operation from a generalized suppurating peritonitis.

Injuries to the spleen are not uncommon. The extent of ruptures and tearing of this organ varies. The hemorrhage is usually severe, early shock is marked, pain may be diffuse or localized in the upper left abdomen with tenderness and rigidity over the splenic area. Where the hemorrhage is severe immediate splenectomy is demanded. Only in the minor tears should suturing or packing of this organ be employed.

Injury to the gallbladder is a very rare occurrence and to the pancreas even more so. Early jaundice as well is peritonitis follows injury of the gallbladder. In injuries of the pancreas shock is immediate and severe and peritonitis develops early. The treatment is early operative intervention with repair and drainage.

In conclusion I wish to again point out that in an individual with a history of injury to his abdomen, and in whom the above mentioned signs and symptoms of visceral trauma are persistent or increasing, immediate operation is demanded without waiting for more specific data.

Tension of the abdominal wall is perhaps the single most important of the objective symptoms of an organic lesion within the abdomen. Its presence, if persistent, justifies immediate surgical intervention.

REFERENCES

1. Condict, W. L.: Perforated gunshot and stab wounds of the abdomen. Ann. Surg., 80:51 (July), 1924.
2. Sutherland, D. M.: Abdominal injuries. Practitioner, 126:674, 1930.
3. Lauer, O., and Schnebel, E.: Injuries by blunt instruments. Beitr. z. klin. Chir., 137:441, 1926.
4. Krecke, Von A.: The early diagnosis of abdominal injuries from blunt objects. München. med. Wchnschr., 73:2035 (Nov.), 1926.
5. Dickenson, Arthur: Treatment of non-penetrating wounds of the abdomen. Amer. Jour. Surg., 2:43 (Jan.), 1927.
6. Lacey, James T.: The traumatic abdomen. Internat. Clin., 3:216 (Sept.), 1929.
7. Vance, B. M.: Injuries of the hollow abdominal viscera. Arch. Surg., 16:661, 1928.
8. Meyer, Karl: Acute traumatic surgery of the abdomen. Minn. Med., 14:150 (Feb.), 1931.

PANTOPON-ROCHE OMITTED FROM N.N.R.

Pantopon-Roche (Pantopium Hydrochloricum), marketed by Hoffmann-La Roche, Inc., is a mixture of the hydrochlorides of the alkaloids of opium containing 50 per cent of anhydrous morphine hydrochloride. The Council on Pharmacy and Chemistry reports that it was accepted for New and Non-official Remedies in 1915 and that, in accepting the product and repeatedly thereafter, the Council has insisted that the firm avoid in its advertising any claim that Pantopon-Roche is possessed of essential properties lacking in morphine. The Council was obliged, however, to remind the firm that its advertising should not contain this claim either directly or by inference; and the firm repeatedly signified willingness to abide by this condition. Recently a circular letter of Hoffmann-La Roche, Inc., was forwarded to the Council by a physician. The intent of this letter to indicate that the action of Pantopon-Roche is essentially different from that of morphine was plain. Furthermore, the letter failed to apprise the physician of the identity of the product, namely, that it is a mixture of the hydrochlorides of opium alkaloids. The Council concluded that Hoffmann-La Roche, Inc., could not be depended on to market Pantopon-Roche with claims which make it acceptable for New and Non-official Remedies and therefore rescinded the acceptance of the product. (Jour. A. M. A., October 3, 1931, p. 1001.)

TREATMENT OF PARANASAL SINUSITIS*

E. R. Bray, M.D.
Saint Paul

THE treatment of sinus disease may be divided into prophylactic treatment and treatment for acute, subacute, and chronic sinusitis. In this paper I wish to emphasize the prophylactic treatment. The nose and sinuses are lined by a very delicate mucous membrane which is well supplied with blood vessels and covered with fine cilia. These cilia in health keep up a continuous to and fro movement which tends to remove foreign particles and excessive secretion from the nose. This action together with the slightly antiseptic action of the mucous secretion tends to free the nose of infection. Any injury to the mucous membrane breaks down this line of defense and allows infection to spread to any part of the nose or to any of the sinuses.

Among the common causes of injury to the mucous membrane of the nose are: sleeping in poorly ventilated rooms and living in over-heated buildings where no means of moistening the air are maintained; irritating gases or vapors; air filled with dust particles, and, to those who are susceptible, certain pollens or other allergic irritants. Another common cause of injury to the mucous membrane of the nose is the long continued use of nasal sprays or ointments or the habit of drawing up watery solutions through the nose under the false impression that they will prevent disease or cure a dry nose. We often use mild sprays in disease conditions over a short period of time but they should never be continued indefinitely. A better way to build up an immunity against nasal infection would be to take regular out-door exercise every day, summer and winter, combined with a varied diet including such foods as milk, butter, fresh vegetables, and fruits, meat or fish once a day and only a limited amount of carbohydrates. Cod liver oil and calcium should also be added to the diet of any one who is subject to nasal discharge or sinus infection. Any good brand of cod liver oil rich in Vitamins A and D is, as a rule, preferable to the more concentrated substitutes.

Proper clothing also is a factor in promoting freedom from respiratory and nasal difficulties. Loose garments sufficient to keep one warm but not enough to cause excessive perspiration are preferable. If one requires wool undergarments to protect against the cold, the wool should be mixed with linen or cotton to absorb the moisture.

Exposure to cold or dampness does not necessarily bring on respiratory disease. The fisherman or hunter or soldier may tramp through a cold drizzling rain all day, sleep in a cold tent at night and feel no ill effects from his adventure.

The treatment of acute sinusitis is the same as for acute coryza. If the symptoms are severe, this should consist of rest in bed, light diet, some alkaline cathartic, hot drinks, mild astringent spray for the nose and some sedative for headache. Surgery is strongly contra-indicated during this stage, as nature has not walled off the infected area, and immunity against the invading organism has not been established. As the pain is caused by pressure from within the sinus, after its natural opening is swollen shut, immediate steps should be taken to relieve this swelling. Pledgets of cotton dipped in 10 per cent argyrol or 1 per cent solution of ephedrin may be placed in the nose and allowed to remain for half an hour, after which mild suction may be used. This can be repeated in three or four hours if necessary for pain. Radiant heat, such as the infra-red lamp, used for half an hour immediately following this treatment, will give beneficial results. The patient should lie on his well side while the radiant heat is being used, to facilitate drainage. Strong ephedrin solution should seldom be used in the nose as the congestion which follows its long continued use is worse than the original swelling. After a sinus infection has lasted four or five days some immunity has been established and mild surgical measures may be considered. If an antrum is the sinus infected and is still causing pain it may be irrigated with warm boric or weak salt solution through a puncture made under the lower turbinate. Place a pledget of cotton moistened with

---

*Read before the Minnesota State Medical Association, Minneapolis, May 6, 1931.

10 per cent cocaine under the turbinate ten minutes before making the puncture. If pus is present in the return flow of the irrigating solution, the puncture-wound should be enlarged with biting forceps to facilitate any necessary subsequent irrigation. A biting forceps is preferable to a rasp, which may leave shreds of tissue that tend to swell and form synechia, making subsequent puncture more difficult.

After ten days we may call sinusitis subacute. Pus that continues to appear under the middle turbinate may come from the antrum or anterior ethmoids or frontals. Hirsh of Vienna says that 90 per cent of apparent subacute ethmoid infections clear up entirely after a diseased antrum has been cured. If a swollen middle turbinate interferes with the drainage it may be infracted. A cystic middle turbinate may have its outer walls caved in to improve drainage. A subacute ethmoid or frontal infection will usually clear up after improvement of drainage at this point. If ethmoid infection and pain continue, it may be necessary to exenterate the ethmoid cells. The Pratt method is the operation of choice, where the work is done under the middle turbinate and the turbinate is not sacrificed. Where the frontal sinus is involved, breaking through the anterior wall of the anterior ethmoid is done at this time. This gives a much better drainage for the frontal sinus than through its natural opening alone. Any attempt to enlarge the natural opening to the frontal with a rasp would only court disaster, as the opening, denuded of its mucous membrane, would soon close and a much more serious condition would follow.

Sinus infection that continues for a month or more may be called chronic. Chronic sinusitis may be divided into the simple chronic, hypertrophic, hyperplastic, purulent and empyemic forms. In the acute stage of sinusitis the cells of the mucous membrane are only swollen. In the chronic stage the cells increase in number as well as in size, forming the chronic hyperplastic stage. In chronic non-purulent sinusitis one must always be on the lookout for some allergic cause. This is the reason that operations on this form of sinusitis are often disappointing. It may be that the flour mill worker is sensitive to flour dust and the young lady who powders her nose is sensitive to some cosmetic rather than some form of bacteria. The chronic purulent hypertrophic sinusitis may also have had an allergic foundation with an infection superimposed on the original trouble. In this case not only must the drainage and ventilation be improved but the original cause of hypertrophy must be remedied if possible. In all chronic sinusitis cases obstructions must be removed with the least loss of important structures. Deviated or thickened septums should be corrected by a submucous resection. This is much better than sacrificing a portion of one of the turbinates. Chronic diseased ethmoid cells should be exenterated as spoken of under subacute sinusitis without the sacrifice of the middle turbinate. The opening to the sphenoid should be enlarged if the sphenoid sinus is involved. An hypertrophied lower turbinate may be partially fractured over toward the outer wall and held in place by a light packing between the septum and turbinate for twenty-four hours. If the soft tissues of the lower turbinate are much swollen they may be treated with a diathermy needle.

Beck, of Chicago, has devised a clever way of performing this operation. The needle is insulated except at its tip. This needle is inserted under the mucous membrane in the soft tissue along the length of the hypertrophy. The current is then turned on while the needle is slowly withdrawn and turned off before the point of the needle quite reaches the surface on its way out. This coagulates the deeper soft tissues but does not destroy the mucous membrane.

A chronic infection of the antrum will usually clear after a large window is made under the lower turbinate. Diathermy may be used in conjunction with this treatment as reported by Granger of Boston and others. Diathermy is contraindicated in acute conditions where drainage is poor but is very useful in chronic cases where drainage is established.

Where too much pathological change has taken place in the mucous membrane of the antrum the Caldwell-Luc operation may be performed. This operation should not often be necessary if other means of treatment at our disposal are used. This can also be said of the external frontal operation with still more emphasis on account of the deforming scar that remains. The empyemic form of sinusitis is a collection of pus in one of the sinuses, usually from a low grade infection. Drainage and ventilation is the treatment. A mucocele is a cyst containing mucous within a cell. No pain is present unless the cyst is large enough to cause pressure symtoms, or to obstruct the drainange of the sinus. The treatment is complete removal.

Although one may lay down general rules for the treatment of sinus disease every case requires individual treatment. Success or failure in the treatment of disease of the nasal accessory sinuses depends on one's ability to provide relief from various conditions encountered without the sacrifice of important tissues.

IS MANGANESE AN ESSENTIAL ELEMENT?

Considerable has been written of late about the possible role of copper as a "promoter" of hemoglobin formation in certain types of anemia. It appears to act as a supplement to iron in this process. A similar function has been attributed to other elements, notably manganese, though the claims are still stoutly denied by the majority of investigators. Manganese is constantly present in animal tissues and this has led to the assumption that it is likely to promote some useful purpose. Experiments have been reported in which the addition of traces of manganese to a diet of whole cow's milk supplemented with iron and copper has a favorable effect on the growth of mice, and that without manganese they failed to ovulate properly. The latter was true also for female rats. These experiments indicate that manganese may be closely connected with the reproductive organs. Other investigators also insist that manganese does not take part in blood regeneration, but that the element aids in rendering a diet complete for the support of reproduction and suckling of young. (Jour. A. M. A., October 10, 1931, p. 1078.)

SOME DENVER FRAUDS

The Home Products Company, Hormex Company, Vitatone Remedy Company, West Medicine Company and Western Medical Clinic, all indecent swindles, have been barred from the mails. Eugene P. Gurley and Robert T. Nash have been operating a concern under two trade names: Home Products Company and Hormex Company. Both were a continuance of the Vital-O-Gland Company which had previously been prosecuted. The Home Products Company was selling preparations for the alleged sexual stimulation of men and of women. The Hormex Company's nostrums were, according to the government report, substantially the same products under different labels. The Vitatone Remedy Company was similar in scope to the Home Products Company and the Hormex Company: it sold alleged cures for sexual weakness. The West Medicine Company and Western Medical Clinic sold through the mails two preparations, 909 and Brigham Young Tablets. The first was sold as a cure for syphilis; the latter as a cure for "lost manhood." Jour. A. M. A., September 19, 1931, p. 868.)

A NEW AND EFFECTIVE NON-SURGICAL METHOD FOR THE TREATMENT OF CHRONIC SUPPURATION OF THE MIDDLE EAR*

Charles Hymes, M.D., M.S., F.A.C.S.
Minneapolis

THE cure of the chronic running ear has long presented a most stubborn problem. Months and even years of treatment with the ordinary text-book methods have yielded in the vast majority of cases discouraging results. It is this fact that has led to the general opinion even among some otologists that one may recommend radical surgery in the case of a chronic suppurative ear which has not yielded to local treatment after a reasonable length of time.

Knowing as we do that the radical mastoid operation frequently fails to effect a complete cure, and complete cure in the mind of the patient means the cessation of his chronic discharge, one naturally hesitates to recommend such a procedure. When this type of operation is recommended, it should be made clear to the patient that the operation is to be undertaken in order to obviate any possibility of intracranial complications and that it may fail to cure the patient's most annoying symptom—the chronic discharge. In addition, the almost total loss of hearing which invariably follows the radical mastoid is a serious factor to be considered.

Patients suffering from chronic suppuration of both ears present a serious problem to the otologist, particularly where the hearing function has not been greatly impaired. The question arises whether to operate one or both ears. If both ears are operated upon, it virtually destroys the patient's hearing. If only one ear is operated upon, it does not safeguard the patient from a possible complication arising from the second ear. Obviously, an effective non-surgical method of treatment is the answer to this problem.

It is true that some cases of chronic middle ear suppuration are so fraught with danger of complications that there is no choice as to the method of treatment. However, in most cases serious complications do not arise. Eminent otologists are agreed that signs and symptoms indicating operation usually present a timely warning.

A consideration of the types of chronic middle ear suppuration becomes appropriate at this point, inasmuch as the proper evaluation of the signs and symptoms in any case of chronic suppurative otitis may be of such importance to the welfare of the patient.

We may classify chronic middle ear disease according to the existing perforation. The non-dangerous type of inflammation presents central perforations which may be either tubal where the perforation is located anterior to the hammer handle and the disease process is located in the eustachian tube, or central perforation where the disease process is more likely limited to the mucous membrane of the middle ear. In neither of these types of cases is surgery justified, for they seldom give rise to complications. The dangerous types are those showing either small central or marginal perforations. The small central type of perforation may be located in Shrapnell's membrane or in the pars tensa of the drum, the former frequently being associated with necrosis of the lateral attic wall and cholesteatoma and are more likely to be complicated by meningitis and temporal lobe abscess. The latter may be complicated by septicemia and lateral sinus thrombosis.

Marginal perforations may involve the entire drum or all of the pars tensa. This type of disease may be associated with cholesteatoma and may be complicated by any or all of the intracranial complications.

There are but few indications for radical surgery; these are the presence of symptoms of impending intracranial complications, cholesteatoma, which only occasionally complicates middle ear disease, and extensive bony necrosis. Bony necrosis is believed to exist in practically every case of chronic middle ear suppuration. The presence of a foul odor to the discharge serves to enhance that belief. However, after observing the disappearance of the foul odor and the subsequent cessation of the discharge with but several treatments by the method I have employed, one is inclined to believe that bony necrosis is present in some cases to only a small degree. However, when the bony necrosis is extensive or when it exists in the body of the mastoid bone itself, so that it is inaccessible to local treatment, radical surgery may be resorted to for its eradication.

---

*From the Department of Ophthalmology and Otolaryngology, University of Minnesota. Read before the annual meeting of the Minnesota State Medical Association, Minneapolis, May 5, 1931.

In that radical surgery is indicated in so few cases of chronic running ears, we are faced with the problem of finding an effective local treatment. I need not recite the older methods of treatment. Their usual ineffectiveness is familiar to us all, and this, no doubt, led to the universal practise and belief that radical surgery is the only permanent cure.

The method I have employed with marked success consists of the use of a mixture of potassium iodide crystals 25 and powdered boric acid 75. The ear is thoroughly cleansed of its secretions and the powder insufflated into the middle ear by means of low air pressure. This treatment is repeated two or three times weekly and the patient is told simply to keep the ear clean. He is not permitted to cleanse the middle ear cavity. There may be considerable smarting when the powder makes contact with the middle ear mucosa, but this passes off shortly. In the case of sensitive patients, the local application of a cotton swab saturated with 2 per cent butyn suffices to prevent any discomfort arising from its use.

The powder on dissolving in the secretions of the ear liberates free iodine, which in turn comes in immediate contact with the diseased tissues of the tympanic cavity. In that the powder when insufflated reaches every crevice of the irregular middle ear, free iodine is enabled to exert its powerful germicidal action on very portion of the tympanum.

A review of the cases treated by this method and the results obtained attests to its efficiency, which at times cannot be considered short of astounding. In some cases the discharge ceased after but one treatment, while in practically all of them a profuse discharge was changed to a scanty one almost immediately and the foul odor, which is chiefly due to the presence of bacillus fetidis, disappeared as quickly. It is seldom that more than six treatments covering a period of two weeks time are required for the cure of a chronic discharge. This stands in marked contrast to the experience of Lederman, who reports in the June, 1930, issue of the *Laryngoscope,* the results of cases of chronic suppuration of the middle ear treated with iodine dusting powder, in that the completion of the treatment of his cases requires from three to six months.

The following are case reports of patients who remained under observation until treatment was completed:

Case 1.—C. G. Age 12. History: Left ear running constantly for ten years. Since 1928 has treated regularly at the University Dispensary with no effect. Examination revealed entire pars tensa of left ear drum gone, foul discharge present. Between April 26, 1930, and May 5, 1930, patient received three treatments of potassium iodide and boric acid powder. Ear was dry on May 5 and has remained dry since. Function of left ear has improved from 10 feet for spoken voice to 20 feet.

Case 2.—Mrs. C. S. Age 42. History: Left ear running since September, 1929, following attack of diphtheria. Examination revealed large central perforation with a foul purulent discharge. First treatment on June 5, 1930. By July 8, 1930, ear was dry. When examined again on February 10, 1931, ear was still dry and had remained dry since she was last treated. Hearing for spoken voice had improved from 3 feet to 10 feet.

Case 3.—S. W. Male. Age 29. History: Running ear since 1915. Radical mastoid performed June, 1929, at University Hospital. Ear continued to discharge since operation. Ear was treated once with potassium iodide and boric powder on June 14, 1930. He was not seen again until October 2, 1930, when the ear was found to be dry, and the information obtained from the patient was to the effect that the ear dried up immediately after he received his treatment in June of 1930.

Case 4.—M. B. Female. Age 65. History: Intermittent discharge from right ear for many years. Ear has been discharging constantly for past three years. Examination revealed large central perforation. She was treated four times between April 28, 1930, and May 14, 1930, when ear was found to be dry. On February 10, 1931, she was again examined and the ear was still dry and had remained so.

Case 5.—D. G. Female. Age 17. History: Had scarlet fever at age of five months and has had discharging ears since. During past five years, ears at times would cease discharging but never for more than two weeks at a time. Examination showed marginal perforations of both drums involving entire lower and posterior half of drum. Function—each ear 18 feet for spoken voice. Whispered voice heard 13 feet in right ear and ten feet left ear. She received four treatments between dates of April 14, 1930, and April 25, 1930, when both ears were found to be dry. In November, 1930, she had a reinfection of the left ear. The ear discharged for two weeks and cleared up spontaneously. Both ears have been dry since, the right one having been dry since April, 1930. This is a case where radical surgery may still be necessary on the left ear.

Case 6.—B. J. Male. Age 17. History: Measles as a baby and has since had intermittent discharge from both ears. Examination showed left ear dry and entire pars tensa gone. There is also a perforation in Shrapnell's membrane. Right ear, entire pars tensa gone, foul discharge. Was given powder treatment between May 22, 1930, and June 2, 1930, when ear was found to be dry. Function in right ear improved from 17 feet to 23 feet for spoken voice.

Case 7.—Mrs. F. O. Age 37. History: Right ear running constantly for past two and a half years. Had all upper teeth removed and tonsils out, but no effect on running ear. Examination showed large central perforation, very foul smelling discharge. Heard spoken voice at 3 feet. Was given one treatment on January 31, 1931. When she returned on February 2, 1931, ear was found to be dry. Function for spoken voice was increased to 8 feet.

Case 8.—H. M. Female. Age 38. History: Seven years ago left ear began to run. Occasionally ear does not run so much and may not run at all for a few weeks. Lately running constantly. Examination showed large perforation in left ear extending to margin and occupying most of posterior half of drum—foul odor. Spoken voice heard at 3 feet. First treated November 10, 1930. On November 13, 1930, there was a slight mucopurulent discharge with no odor. On November 17 after second treatment her ear was dry. Spoken voice improved to 5 feet. Ear remains dry to date.

Case 9.—B. J. Male. Age 73. Constant discharge from right ear for past five years following an acute cold—foul odor. He had had considerable treatment to no avail. Examination showed pars tensa of right drum gone clear to margin. Polypi and granulations in middle ear extending from auditis. He was treated between dates of July 15, 1930, to August 4, 1930. On last visit ear was dry and has remained so. Was given treatment of boric and potassium iodide powder and two applications of 25 per cent silver nitrate to granulations.

Case 10.—G. K. Male. Age 45. History: Left ear has discharged for many years. Has had two operations on ear, the last one a radical mastoid about five years ago. Ear has never stopped discharging. During June, 1930, he received three powder treatments. On June 15, 1930, his ear was dry.

Case 11.—B. G. Female. Age 23. History: Mastoidectomy right ear five years ago. Has had intermittent discharge from right ear since. During past six months discharge has been constant. Examination showed large central perforation with foul purulent discharge. Spoken voice heard 14 feet. Treated between May 29, 1930, and June 14, 1930, when ear became dry. Function right ear improved to 20 feet for spoken voice.

Case 12.—M. K. Female. Age 17. Radical mastoid left ear three years ago—ear has been discharging since. Right ear also draining and shows large tubal type of perforation. Was first treated May 24, 1930. July 8, 1930, both ears were dry. Was seen again September 20, 1930, when ears were both dry.

Case 13.—A. K. Male. History: Simple mastoid on left ear eleven years ago. At about same time right ear began to discharge intermittently. Discharge has been constant during past six months. Treated once on October 13, 1930, after which ear became dry and has remained so to date. Hearing, spoken voice 10 feet before treatment. Improved to 15 feet.

Case 14.—H. P. Male. Age 18. History: Intermittent chronic running left ear for ten years following scarlet fever. Right ear operated ten years ago and has not troubled since. Examination showed fetid discharge from left ear—large central perforation. Received eight treatments between January 6, 1931, and February 2, 1931, when ear was dry. Hearing on this ear for spoken voice improved from 6 feet to 10 feet.

Case 15.—C. S. Male. Age 21. History: Scarlet fever at 9 years of age—right ear has discharged intermittently since. June, 1929, radical mastoid was performed on right ear. However, discharge has been constant from this ear since the operation. Received two treatments of the boric acid and potassium iodide powder, on June 11, 1930, and June 13, 1930. When he was examined on June 16, 1930, the ear was found to be dry.

Case 16.—L. P. Male. Age 16. History: Measles thirteen years ago—intermittent discharge since. At times ears are dry but never longer than two weeks. Examination showed pars tensa of both ear drums gone from marginal perforations. Hears spoken voice right ear 14 feet, left ear 1 foot. Whisper right ear 4 feet, left ear 6 inches. Treated between June 9, 1930, and July 7, 1930, when both ears were dry. Spoken voice had improved on the right ear to 18 feet and left ear to 3 feet.

Case 17.—V. R. Female. Age 18. History: Scarlet fever at fourteen months of age. Both ears have been running constantly since. Had extensive marginal perforations of both ear drums. Spoken voice heard on right ear 3 feet, whisper 6 inches. Left ear, spoken voice 2 feet and whisper 3 inches. Treated between June 3, 1930, and July 5, 1930, when both ears were dry. On July 21, 1930, she developed an acute exacerbation of the left ear with slight elevation of temperature. She was sent in to the University Hospital, where radical mastoid was performed on July 23, 1930. At operation we found necrosis located within the body of the mastoid itself. On November 6, both ears were dry, spoken voice right ear at 8 feet and whisper at 5 feet. Left ear, spoken voice heard at 3 feet, and whisper at 1 foot.

Case 18.—M. S. Male. Age 67. Has had a discharging left ear since nineteen years of age. Discharge has been constant. Examination revealed a foul purulent discharge with a double perforation extending to the margin of the drum. Was able to hear only loud noise on contact. Was treated on February 26, 1931. On the following day he returned for examination. Only a small amount of mucoid discharge was found in the middle ear and odor was gone. On March 1, 1931, ear was dry and has remained dry since. Function not improved.

Case 19.—A. B. Male. Age 11. Has had intermittent chronic discharge from both ears for past year with impaired hearing. Right ear revealed a large central perforation behind the hammer handle and a small central perforation in Shrapnell's membrane. The ear, however, was dry. The left ear showed a large marginal perforation, involving about one-third of the posterior portion of the drum with a foul, thick, purulent discharge. Hearing, right ear, spoken voice 8 feet; left ear, 3 feet. The discharging left ear was first treated on March 3, 1931. On March 4, 1931, this ear showed very little discharge and the odor had disappeared. He returned on March 11, 1931, when the ear was found to be dry after having received two treatments. Hearing on this ear was now found to be 12 feet for spoken voice.

Case 20.—S. K. Female. Age 23. History: Has had a chronic discharge from left ear since 1912. Examination reveals large marginal perforation involving the entire pars tensa of the drum. Hears spoken voice on contact. Discharge is foul and purulent. Was first treated on December 20, 1930. On December 22 the discharge was only scant and odorless. On December 23, ear was dry. Since this date, the patient has had two exacerbations, the last one having occurred on April 14, 1931, at which time there was a recurrence of the discharge and moderate mastoid tenderness. The ear is still under observation and the patient has been advised that a radical mastoid operation will in all probability become necessary inasmuch as it is believed that there must be considerable necrosis in the mastoid process itself, although X-ray shows only a sclerosis of the mastoid. The patient has accepted this advice and the ear will be operated upon shortly.

In conclusion let me state that the above cases represent a fairly average series with which we are called upon to deal. Some cases, it is noted, responded to but one treatment, some to two or three, and that a few required more. It is to be seen also that the treatment is particularly effective following the radical mastoid operation. This ought to make this method of treatment particularly acceptable, inasmuch as in the experience of the average otologist the cessation of the chronic discharge does not take place in more than half of the cases operated upon radically. Its limitations are also demonstrated in that several cases developed an acute exacerbation of a chronic mastoiditis. In one such case, the radical operation was resorted to, and it was recommended for still another.

The results obtained on the cases sighted, in my opinion, far excel results obtained by the usual local treatment of chronic middle ear suppuration. Our experience with this type of treatment offers convincing proof that every case of chronic middle ear suppuration should be offered the benefits of the non-surgical treatment described, save those where there is positive evidence of serious impending complication and where there is very good evidence that local treatment cannot possibly be permanently effective, such as in cases of cholesteatoma where the cholesteatoma cannot be removed through the external auditory canal, and in cases where necrosis exists in the mastoid body and thus is inaccessible to any form of local treatment.

753 MEDICAL ARTS BLDG.

CASE REPORTS

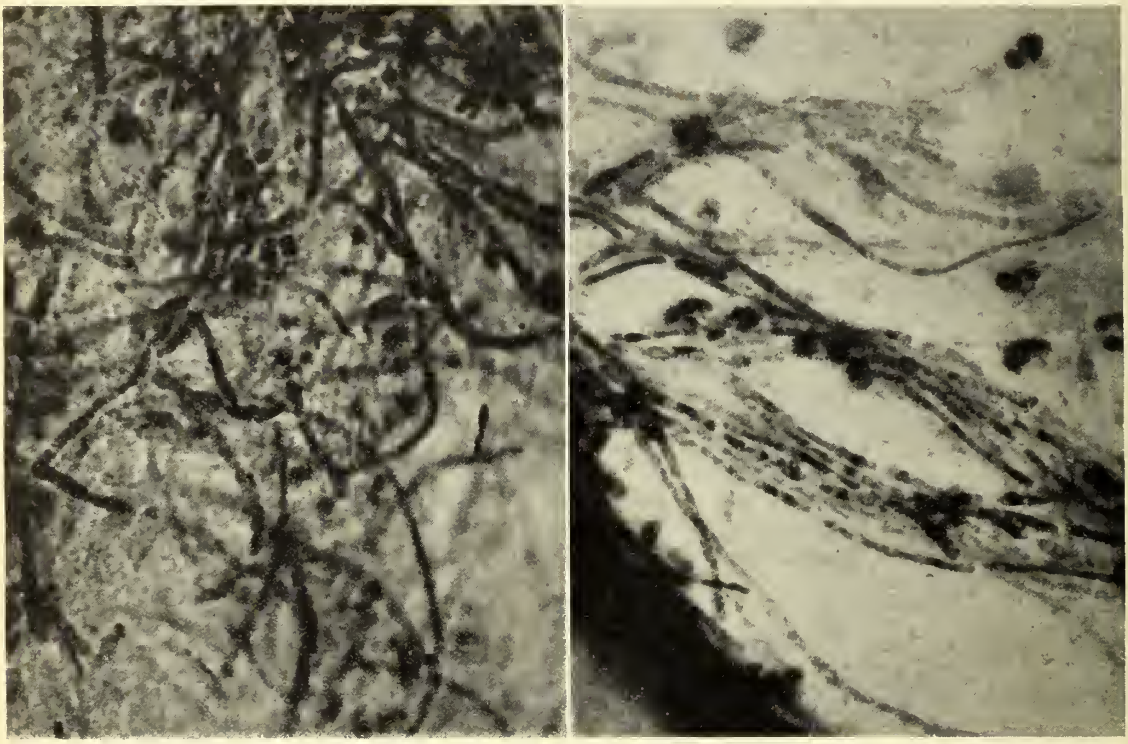
VAGINAL THRUSH

REPORT OF A CASE

Ruth E. Boynton, M.S., M.D.*
Minneapolis

Infections of the vagina and cervix with yeast-like organisms have been recognized for many years. Until recently, however, vaginal infections due to these organisms belonging to the Monilia group were considered uncommon. Plass (1) et al. have recently given a very complete review of the literature on this subject. Their own observations show that the Monilia organisms are frequently found, not only in women complaining of vaginal discharge, but also in the vaginas of women with no symptoms. The literature also brings out the fact that Monilia infections occur much more commonly in pregnant than in non-pregnant women. Since few cases of this type of vaginitis have been reported in non-pregnant women, the following case report is given:

A young woman, aged nineteen, was seen on July 22, 1931, complaining of intense itching about the vulva associated with a watery vaginal discharge which began July 18, 1931. Two days after the onset of these symptoms, she began to have a "cheesy" discharge from the vagina. She had no urinary symptoms. The patient gave a history of having had intercourse at frequent intervals for several months, the last time one week prior to the onset of the symptoms. Her last menstrual period was July 6.



Vaginal Smear—Stained with Gram's stain. Photomicrograph × 850.

A pelvic examination showed the introitus to be very red. Bartholin's and Skene's glands were not palpable. The entire vaginal wall was covered with a thick white membrane which was very adherent. The appearance of this exudate was typical of the exudate seen in oral thrush. The cervix was reddened but was not covered with the exudate. Smears showed large numbers of mycelial threads with their buds. They were gram-positive. No gonococci were present. Cultures for diphtheria bacilli were negative. Cultures for Monilia were made on an acid medium prepared by Dr. A. T. Henrici of the Department of Bacteriology and typical growths of Monilia were obtained and identified by Dr. Henrici. Urinalysis was negative.

---

*From the Students' Health Service and Department of Preventive Medicine, University of Minnesota.

On July 23, 1931, one day after her first visit, at which time no treatment had been given, the exudate was thinner and less adherent. On removal of the membrane, the wall of the vagina was markedly inflamed. At this visit, the entire vagina was swabbed thoroughly with a 1 per cent aqueous solution of gentian violet, as suggested by Moench (2), Cooke (3), and others. The patient was instructed to take douches of sodium bicarbonate the following day and return the third day for further local treatment. She telephoned that she was unable to come for further treatment, but that she had had complete relief from her symptoms from the one application of gentian violet. She has not been seen since. A communication received from her early in October stated that she had had no recurrence of any of the symptoms. Whether this patient is permanently cured cannot be predicted as these cases frequently undergo spontaneous relief of symptoms and months or years later may have a recurrence.

In this case, the typical thrush-like character of the exudate in the vagina made possible a clinical diagnosis of Monilia vaginitis which was substantiated by microscopic examination of the smears. In many cases of Monilia vaginitis, the appearance of the vagina is not so characteristic and a diagnosis can be made only upon examination of the smears. The mycelial threads and buds stain readily with Gram's stain (Gram +) and can easily be identified.

The accompanying microphotographs were taken from the vaginal smear stained with Gram's stain in this case. The characteristic mycelial and conidial forms of the organisms readily show up as Gram-positive organisms.

REFERENCES

1. Plass, E. D., Hesseltine, H. D., and Borts, I. H.: Am. Jour. Obst. and Gynec., 21:320 (March), 1931.
2. Moench, L. M.: Med. Clin. of No. Am., 1581 (May), 1929.
3. Cooke, W. R.: Texas State Jour. Med., 24:357, 1928-29.

PULSION DIVERTICULUM OF THE ESOPHAGUS*

H. D. Nagel, B.S., M.D.
Waconia, Minnesota

Pulsion diverticulæ of the esophagus are still of sufficient importance to warrant their reporting and inclusion in the literature.

The first reported successful operation for this condition which I was able to find in searching through the literature was that performed in 1886 by Wheeler of Dublin. This was a one-stage operation. Because, however, of its attending high mortality rate, this method of operation has been supplemented by the various two-stage operations of Goldman, Halstead, Murphy, C. H. Mayo, and Judd. These consist of a free dissection of the sac at the first operation, and its complete removal later. The chief and important advantage of the two-stage operation is its comparative freedom from lung and mediastinal complications. Glaub and Jackson performed the combination esophagoscopic and surgical method of operation in these cases. Recently C. Kennedy and Phelps reported a case successfully treated in this manner. A more recent case treated by the two-stage method is reported by C. W. Webb. In reviewing the literature I found that the majority of the reported cases were older than the age of my patient.

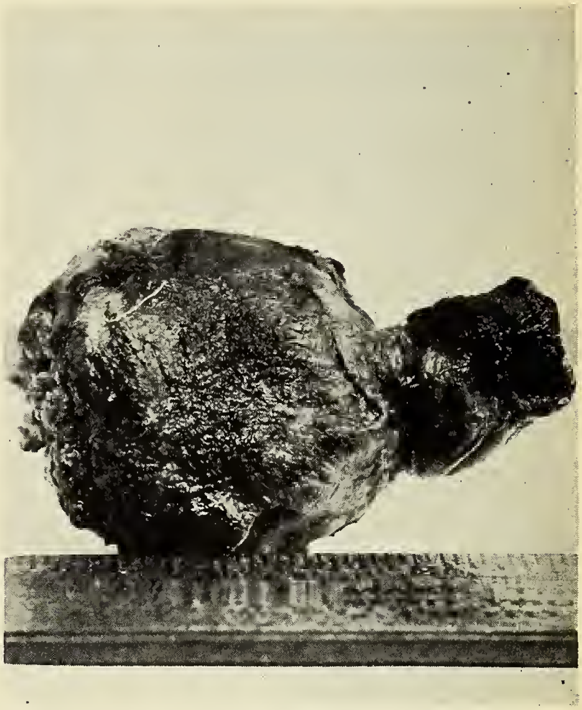


Fig. 1.

I was called to see Mrs. E. Z., a white married woman of forty-seven, who gave the following history. Her present illness began January 18, 1931, at 4 a. m., with a sharp sudden pain in the lower abdomen, more marked over the right side. The pain continued and increased in severity until 11 a. m., when I was called to see her. Her temperature was sub-normal, pulse 88, respiration 18, and there was muscular rigidity of the right rectus muscle, and tenderness over this area.

Her past history recorded a tonsillectomy a few years ago, and an operation for the cure of a rectal fistula in 1918. She had had one child, who was living and well, and had had no miscarriages. The husband was living and well.

Physical examination showed nothing abnormal except the following: A soft mass was present on the right side of the neck suggesting an enlarged thyroid lobe. The lower right quadrant of the abdomen was rigid and tender but there was no distention or mass present. Pelvic examination revealed a tender adnexa, more so on the right, but no palpable mass.

---

*Presented before the Eitel Hospital Staff meeting, Minneapolis, May 22, 1931.

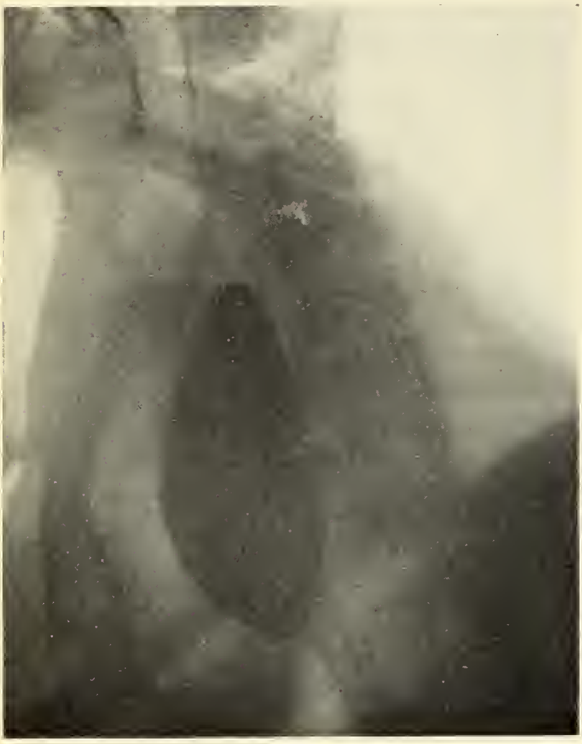


Fig. 2. Lateral view.

The urine was normal, as was the blood picture, except for a leukocyte count of 15,000. A former basal metabolism rate had been a plus 1.

A diagnosis was made of acute appendicitis and the patient was removed to the Eitel Hospital, where I operated upon her for this condition. At the operation, yellow-tinged fluid was found in the vicinity of the appendix and cecum and a larger amount in the pelvic cavity. This fluid was removed by suction. The appendix, which was adherent, swollen, and inflamed, was removed in the usual manner by inversion of the stump and a purse-string method. The gallbladder was found distended, its walls thickened and did not empty well on pressure. The stomach was normal. Three penrose drains were placed in the abdomen, which was closed in the usual layer method. One drain was removed on the fourth and the others on the sixth postoperative day. She made an uneventful recovery, except on the fifteenth day, when an attack of pleurisy set in, which quickly subsided in two days.

During her convalescence the patient noticed, at various times, considerable difficulty in swallowing food, which she attributed to a swelling in her neck. She had the impression that this swelling was a goiter. Due to the fact that she had a basal rate of plus 1 in July, 1929, because the neck varied in size from day to day, and because the swelling was soft and fluctuant, I ordered an X-ray examination. This was performed February 6, 1931, and revealed a diverticulum of the esophagus, 8 cm. long and 9 cm. wide. The lower border of the diverticulum appeared close to the suprasternal notch. On February 7, an esophagoscopy was performed by Dr. Phelps of Minneapolis, a diagnosis of benign diverticulum made, and operation advised.

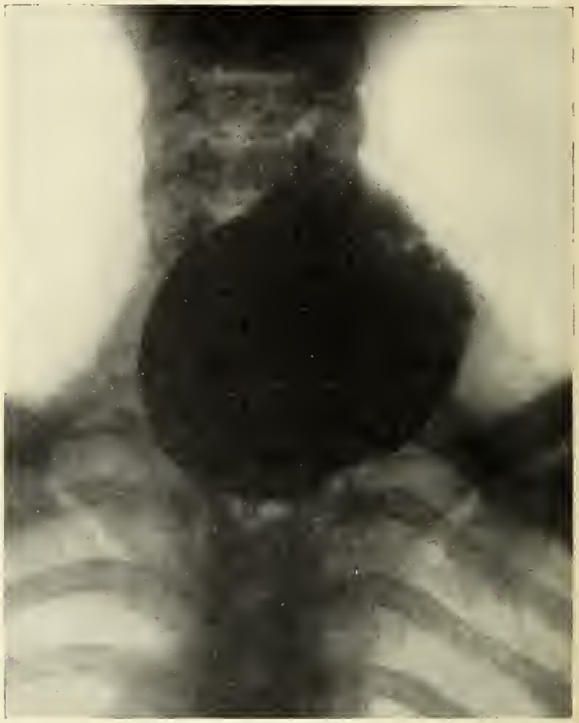


Fig. 3. Anterior-posterior view.

On February 9, 1931, under general anesthesia, the first-stage operation of this diverticulum was performed. An incision was made along the anterior border of the right sterno-cleido-mastoid muscle. The skin, platysma and deep fascia were divided, as was also the deep fascia of the neck. The right lobe of the thyroid was retracted medially and the sterno-cleido-mastoid muscle laterally. The omohyoid muscle was not divided. This incision gave a good exposure of the sac, which was dissected free from its bed and the trachea by blunt and gauze dissection. The neck of the sac was then carefully liberated down to the true esophagus. The sac was then sutured to the edge of the sterno-cleido-mastoid muscle, in an attempt to avoid its possible retraction. Gauze was loosely packed into the former bed of the diverticulum. The skin was closed with skin clips. Vaseline gauze strips were placed along each side of the incision and over the sac.

The following day the patient could swallow liquids without distress. By the fourth day the entire gauze pack was removed. On February 17, or eight days following the first-stage operation, the incision was reopened, and the sac excised at its neck between forceps. Fine chromic mattress sutures were placed behind the forceps on the stump. The forceps were then released and a continuous suture so placed as to control bleeding and bring the edges together. Three more mattress sutures were put in back of the first row. All bleeding being controlled, the incision was closed, chromic sutures being used in the fascia. Skin clips were again used for skin closure. The upper end of the incision was left partially open for drainage. For forty-eight hours no fluids were permitted by mouth, dressings were changed daily and on the fourth day a mucopurulent drainage appeared. Skin clips were removed on the sixth and eighth post-operative days. Drainage continued about the same until the tenth day, when each succeeding day showed a decrease. In four weeks the incision remained perfectly dry. An X-ray film taken five weeks postoperatively is shown. I am indebted to Drs. Robitshek and Herman, of Minneapolis, for their kind assistance.

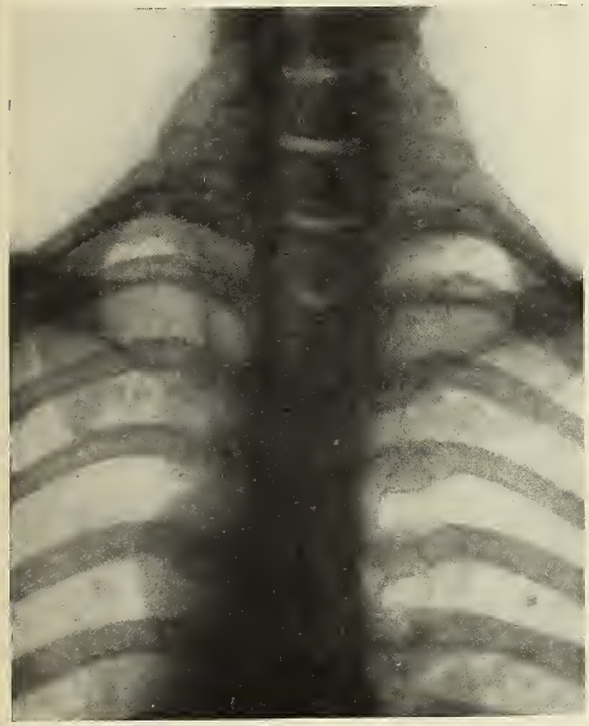


Fig. 4. View taken five weeks later, after operation.

BIBLIOGRAPHY

1. Hill, William: Pharyngeal and esophageal diverticula. Brit. Med. Jour. (Dec. 18), 1916.
2. Judd, E. S.: Esophageal diverticula. Surg., Gyn. and Obst. (Aug.), 1918.
3. Guab, Otto E., and Jackson, Chevalier: Pulsion diverticulum of the esophagus. Surg., Gyn. and Obst. (July), 1915.
4. Jackson and Shallow: Diverticula of esophagus. Pulsion, traction, malignant and congenital. Am. Surg. (Jan.), 1926.
5. Kennedy, C. C., Phelps, Kenneth, and Gates, Russell: Surgical treatment of pharyngeal and esophageal diverticula. Minn. Med. (Oct.), 1928.
6. Webb, C. W.: Pulsion diverticulum of the esophagus. Clifton Medical Bulletin (Jan.), 1931.

RECTAL MYOMA

Harry F. Bayard, M.D.
Minneapolis

Cases of unusual pathology are reported usually because of the interest generated by a mistaken diagnosis. The case I am reporting here is of rare occurrence and was mistaken for a rectal abscess largely because of the fact that it presented, in addition to the mass felt, an opening in the dentate margin posteriorly and a sinus running up in the direction of the mass, near which a small external opening existed.

Three cases of true rectal myoma are collected and reported by Tuttle in his text, but he reports no case of his own. Gant, in his last edition, does not recall having ever seen a rectal myoma himself. Fibromyomata occur more frequently than the true myoma but even these are uncommon.

The patient was a white male, aged 59, who worked as a fisherman. His chief complaints were, first, a draining sinus in his left buttock, and, secondly, an adenoma of the thyroid. His past history includes only rheumatic fever at twenty-one years. His family history is irrelevant.

The physical examination showed a male weighing 130 pounds and 68 inches in height, with a blood pressure of 130 systolic and 80 diastolic, pulse 74, temperature 98.8°. Teeth were badly worn and pyorrhea (grade II) present. There was a nodular bilateral adenomatous goiter (grade III), without hyperthyroidism; peripheral sclerosis (grade III). A soft, tender mass the size of a hen's egg distended the skin at the left postanal margin. This mass lay outside of the lower left posterior rectal wall. There was a small sinus opening near this mass.

Laboratory findings: Urinalysis—Sp. gr. 1026, acid, albumin 0, sugar 0, micro. negative.

Blood Count—Hemoglobin 70 per cent.

Wassermann—Negative.

A preoperative diagnosis of rectal abscess was made and under sacral anesthesia he was operated upon. The operative procedure was as follows:

A probe was passed into the internal opening and another into the external opening and the incision was made from the internal to the external opening. Then on attempting to palpate the probe through the internal opening a larger cystic mass about 8 cm. long and 5 cm. in diameter was found. This was easily removed by blunt dissection with the finger. It apparently communicated with the same internal opening as the fistula. It contained some fluid about the consistency of water and apparently some mucus but no hair. It closely resembled a post-anal or post-rectal dermoid which had become infected. The cavity thus formed was irrigated with mercurochrome and the distal margin closed except for a small area one cm. long through which a rubber drain was inserted. The mass contained several large cavities and apparently some of the wall was cystic. The fluid had a rather peculiar odor, smelling somewhat like amniotic fluid.

Pathological report: Rectal myoma.

Postoperative notes: The wound filled in by granulation and left the anal canal flexible and competent.

420 Medical Arts Building.

PRESIDENT'S LETTER

I BEGAN my term of office as President of the Minnesota State Medical Association, with a solemn sense of the responsibility and no small sense of apprehension.

Now I am about to close it and in this salute and farewell I am happy to extend most earnest thanks to my fellow officers in this Association, its councilors and committees for their support and assistance, this year. Their coöperation has made my task a pleasure as well as a very distinguished honor.

Our association progresses steadily towards a unity and cohesion that is almost unexampled, I believe, in state bodies of other kinds. It is a power and a factor to be reckoned with on the outside in all fields that legitimately concern it. It is an equally important factor in the maintenance of scientific standards and public conscience among its own members.

These are proud things to say of any organization and I say them with due humility since my part in bringing them about has been infinitesimal in comparison with the general contribution.

The times are critical for the profession of medicine in the United States. We stand, now, where we can see just beyond us—at one turn of the road—the possibility of a system of state medical practice in America comparable to those in effect in the majority of European countries. The path leading to socialization or a paternalistic bureaucracy for the care of the sick seems to many wise men outside of the medical profession, as well as to the majority of physicians themselves, to be an alien by-road unsuited to American institutions and habits of mind. We must not forget however that strain, the presence of economic hysteria, makes it easy to mistake the road.

It is our responsibility to stand guard—if I may continue my figure—at dangerous crossroads; if social medicine is indeed the proper destination for American medicine, then we must point the way. If it is not, then we must direct the private practice of medicine into a wise and effective readjustment of our methods in relation to preventive medicine, adequate distribution of medical care at all income levels and proper medical care for the indigent.

In this connection there is one thing I would particularly urge upon our own membership. That is, in fact, a thorough reading each month of our own medical journal.

The social and economic aspects of medical practice in Minnesota will be discussed at length in the columns of Minnesota Medicine this next year—and by men qualified above the average to deal with them. We cannot do better to prepare ourselves for crises ahead than to follow closely the letters of our new president from month to month; the page forums of our Committee on Public Health Education; the reports of our Committee on Medical Economics and of the Women's Auxiliary. In my opinion it is the individual responsibility of every member of the association to know just exactly what are the public policies of his organization and where they will lead him.

In the end, public welfare as well as the fate of American medicine rests upon the balance and information and social conscience of that already heavily burdened social functionary, the family physician.

L. Sogge

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

Official Journal Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society.

Owned and Published by
The Minnesota State Medical Association
Under the Direction of Its
EDITING AND PUBLISHING COMMITTEE
A. S. HAMILTON, M.D.....Minneapolis
D. C. BALFOUR, M.D.....Rochester
J. T. CHRISTISON, M.D.....St. Paul
E. L. GARDNER, M.D.....Minneapolis
JOHN M. ARMSTRONG, M.D.....St. Paul
R. E. FARR, M.D.....Minneapolis

CARL B. DRAKE, M.D., St. Paul.....Editor
Lewis M. Daniel, M.D., Minneapolis.....Assistant Editor
Associate Editors
A. B. Stewart, M.D., Owatonna.....First District
F. M. Manson, M.D., Worthington.....Second District
Geo. B. Weiser, M.D., New Ulm.....Third District
H. B. Aitkens, M.D., LeSueur Center.....Fourth District
F. U. Davis, M.D., Faribault.....Fifth District
E. L. Gardner, M.D., Minneapolis.....Sixth District
Paul Kenyon, M.D., Wadena.....Seventh District
O. E. Locken, M.D., Crookston.....Eighth District
E. L. Tuohy, M.D., Duluth.....Ninth District

J. R. BRUCE, Business Manager
2642 University Avenue, Saint Paul, Minnesota
Telephone: Nestor 1381

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Journal itself, not to individuals.

The right is reserved to reject material submitted for either editorial or advertising columns. The Editing and Publishing Committee does not hold itself responsible for views expressed either in editorials or other articles when signed by the author.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

The rate for classified advertising is five cents per word with a minimum charge of $1.00 for each insertion. Remittance should accompany order. Display advertising rates will be furnished on request.

Contents of this publication protected by copyright.

Subscription Price: $3.00 per annum in advance. Single Copies 25c. Foreign Countries $3.50 per annum.

Vol. XIV December, 1931 No. 12

STATE MEDICINE FOR 4,000,000 VETERANS

Following the World War medical specialists were employed on a part time salary basis under the United States Public Health Service to care for disabilities of veterans resulting from service. It was not long before the Veteran's Bureau operated hospitals of its own and used the services of full time physicians in the employ of the Bureau except for certain consultants. It is a question whether the change in policy furnished the veterans with better medical service as a whole.

In 1924 the scope of disabilities cared for by the Veterans' Bureau was extended to include certain specified disabilities irrespective of their service origin. The next step was to provide in 1926 free hospital care for all veterans *without regard to the nature or origin of their disabilities.* This provision was protested by our national medical organization and various state medical organizations, including our own, as un-American, and physicians were not alone in their objections.

Following this extension of service in 1926 the percentage of non-service disabilities cared for in the veterans' hospitals has increased until in 1930 they comprised a majority of the patients cared for in the 33,128 beds now in existence. According to Dr. Shoulders, the medical council of the Veterans Bureau estimates that a maximum of 129,859 beds will be needed. This means the continuation of an extensive building program during the next few years to provide about 100,000 additional beds.

To quote from a comprehensive article on the subject by Dr. H. H. Shoulders of Nashville which appeared in the A. M. A. Bulletin for October:

> "The average cost of constructing veterans' hospitals is approximately $3,500 per bed. The average cost of the professional staff is $151.56 per year per bed. The cost of maintaining these hospitals in 1930 was $4.42 per bed per day, or $1,613.30 per year per bed. The cost of completing the construction program alone would amount to over $360,000,000. The cost of the professional staff would amount to over $19,000,000 per year, when completed. The cost of maintenance, when completed, would be about $200,000,000 per year. These are not all. The cost of equipment and the cost of transportation of veterans to and from the hospitals cannot be even approximately estimated."

The figures were obtained from the Veterans' Bureau and the estimate of the enormous cost of this hospital building and maintenance program is alarming to taxpayers in general. This cost will be in addition to present appropriations. Private hospitals for the most part erected and operated through generous private contributions and at present about half filled will feel the effect of newly constructed government hospitals, and many will doubtless have to close their doors. More and more veterans will be taken out of the field of private medical practice.

Those who have observed the operation of the present plan of providing hospital benefits to veterans know that the hospital benefits are not and cannot be evenly distributed. Only a very few veterans can live as near a veterans' hospital as a private one. In case of an accident or acute illness requiring prompt surgery the proximity of hospital and surgeon is frequently vital. In certain parts of the less densely populated portions of the country the veteran is hundreds of miles from the nearest government hospital. What is the result? Vital time is lost in reaching the hospital, the long trip is deleterious to eventual recovery, and the patient is better off if he employs the local hospital and physician and pays his expenses himself. Transportation to the nearest government hospital is incidentally a big item of expense to the government and eventually to the taxpayer.

Take a concrete example. A veteran develops a pain in the abdomen. If he lives near enough to a veterans' hospital he seeks relief. Hospitalization is not deemed advisable. By evening the pain becomes unbearable; a private physician is called; the symptoms of acute appendicitis are full blown and immediate operation in a private hospital becomes necessary. Or take an extreme example of a veteran requiring a tonsillectomy. He is advised of the necessity by his private physician. He chooses to have the operation done at government expense. Transportation is provided after more or less delay to the nearest government examiner, who may be miles away. The advisability of operation is determined. Transportation is furnished to the nearest veterans' hospital, perhaps a day's journey distant. The veteran is detained in the hospital where he can be under supervision until fully recovered and given transportation home. The veteran loses a month in time instead of three days and the performance has cost the government three or four hundred dollars.

Numerous similar instances could be cited.

What remedy is there for the situation?

There is a remedy in the proposition known as the "Shoulders resolution" submitted to the House of Delegates of the A. M. A. at its last session. Instead of continuing the present hospital building plan the proposal in a nutshell provides that each veteran be allowed hospital and disability benefits in case of sickness, which will enable him to select his own local hospital and physician. The case is checked by a representative of the Bureau as at present in insurance cases. This would be to the advantage of the veteran, an economy to the government, a life saver for many private hospitals, and would preserve that fundamental relation between patient and physician which permits the selection of the medical advisor. It is not surprising that in numerous instances where the plan has been explained to groups of veterans it has met hearty approval.

THE STATE ASSOCIATION—WHAT IT HAS DONE AND IS DOING

It is customary for business firms to take stock once a year to get a clear idea of their profit and loss. Perhaps many of our members who faithfully pay dues annually into the treasury of the State Association wonder just what becomes of their money and would be interested in having a summary of the work done through their dollars.

Consider first the two boards whose work is most effective because of the efforts of the Association. I refer to the State Board of Medical Examiners and the Basic Science Board. What have they done for the medical men of Minnesota?

From 1925 to 1930, 1,585 poorly qualified physicians were graduated in the United States. This figure is taken from the report of the Council of Medical Education and Hospitals in the Journal of the American Medical Association of April 25, 1931. Their table shows that not one of the 1,585 poorly qualified physicians is located in Minnesota.

From 1924 to 1927 inclusive, before the creation of the Basic Science Board, there were licensed annually an average of 195.5 physicians, 11 osteopaths, and 46.5 chiropractors. From 1928 to 1931 inclusive, following the passage of the Basic Science Law, the yearly average was 192.25 physicians, 5.75 osteopaths, and one chiropractor.

The figures for licensed masseurs show that 215 were licensed in 1929, 201 in 1930, and 189 in 1931. As you all know, before the new Masseur's law placing their licensing in the hands of the State Board of Medical Examiners was passed, there were many quacks practicing medicine under a masseur's license. We never did have any quarrel with legitimate masseurs.

Prior to 1928, there were so few convictions for infractions of the medical practice act as to be practically negligible. Since 1928 the State Board of Examiners has had money derived from registration fees with which to work. In the period from 1928 to date, 196 infringement cases were investigated. Fifty-one were court cases. Forty resulted in conviction and one is still pending. The legal expense has been practically $21,000.00.

We might classify the educational work of the State Association under three headings: (1) for ourselves; (2) for the public; (3) other work to help smooth over the rough places in Medicine.

Under educational work for ourselves, we have the yearly scientific meetings, the extension courses, and MINNESOTA MEDICINE, which ranks high among the journals of its type in the United States. The Consultation Bureau reported some 110 cases in the Journal in 1930. Mention might be made of the Historical Committee, which is about ready to print its first volume.

The educational work for the public is only a few years old. Radio talks for the past three years appear to have been well received by the public. The news service reaches 300 newspapers. Eleven public health meetings were held throughout the state in 1930. We coöperated in the campaign for diphtheria prevention. *Hygeia* and *Everybody's Health* were sent to every member of the Legislature.

This matter of public education may be more or less intangible, as far as results are concerned, but my belief is that it is one of the well worthwhile things that we do and cannot fail to create a more intelligent viewpoint of the medical profession on the part of the public. We are particularly fortunate in this matter of public contact in the fact that our own secretary also represents the largest lay organization in the state, whose function is Public Health work.

We now come to Committee work to help smooth over the rough places.

The Contract Practice committee has been dropped but its successor is known as the committee on Industrial Practice and, under the chairmanship of Dr. Frank Burch, has already considered many matters concerning the relationship of the individual to industrial medicine. Incidentally, Dr. Burch tells us that the present State Industrial Commission is both approachable and coöperative.

We shall not do more than mention the committees on Medico-Legal Affairs, University Relations, the one to investigate the schools for Laboratory Technicians, and that on State Health Relations. They are all doing valuable work.

We now come to the committee which has spent a lot of money but has put us in a very prominent place on the medical map of the United States. We shall mention only a few high spots of the work of the Legislative Committee. The statute of limitations limiting the time in which a malpractice suit may be brought to a two year instead of the former six year period, saves us annually, in malpractice insurance, much more than our annual dues of $15.00 to the State Association. This is beautifully shown in a recent bulletin from Dr. Meyerding's office in which the North Dakota rates, where the six year law prevails, are listed from $50.00 up—for the same protection which costs us $21.00.

The Basic Science Law and the modification of the Medical Practice Act have eliminated from Minnesota many poorly qualified medical men and at least forty-five new chiropractors per year and has helped greatly in meeting some of the criticism of some of our own members "that we have no right to pose as nickel plated angels when we harbor crooks and abortionists amongst our own membership."

The continuation of the service of furnishing Wassermann tests to physicians throughout the state was the result of the efforts of this committee.

We are still able to render our own bills in industrial work instead of accepting a fee schedule of the Industrial Commission.

Also, there have been defeated in the past four or five sessions of the Legislature, very many pernicious measures which, if passed, would have menaced scientific medicine and have broken down all bars which, at present, serve to protect the citizens of Minnesota from charlatans, quacks, and frauds.

F. J. S.

A FORUM OF THE
COMMITTEE ON PUBLIC HEALTH EDUCATION

WHERE THE DOCTOR IS PUBLIC HEALTH WORKER

One of the most important reports on record of a successful coöperation between a County Medical Society and a city health department appeared recently under the title "The Physician as Health Worker" by L. O. Geib and Henry F. Vaughan, both of Detroit, in a recent issue of the Journal of the American Medical Association.

This report is now available as a reprint which might serve as a model for any public health program in any city. In this case it involved a two year diphtheria immunization campaign carried on by the Wayne County Medical Society of Detroit and the Detroit City Department of Health.

Following the launching of this joint plan no further free clinics for administration of diphtheria protection were held anywhere in Detroit. All immunizations were given at a fixed rate between certain fixed hours in the offices of private physicians. The results up to June 1, 1930, were that a very high percentage of children have already been immunized. The actual figures are 80 per cent of all school children and 70 per cent of pre-school children, who have received protection.

Below are some significant extracts from this reprint, copies of which are available from the Wayne County Medical Society. It is well worth the time of anyone interested in public health programs from the standpoint of the private physician, to read the entire reprint:

"In Detroit, as elsewhere" this Detroit report says, "the Health Department has maintained public health clinics over a period of years, with the purpose of teaching pre-natal care to the expectant mother, furnishing instruction to promote infant welfare and preschool and school hygiene, supplying information to those who have been exposed to such communicable diseases as tuberculosis and the venereal diseases, and providing prophylaxis against smallpox and diphtheria. We believe that such clinics have an educational value and are needed during a period of demonstration. Beyond this, there is no justification for their existence except to take care of that small fraction of the population which is always indigent or nearly indigent. Preventive medicine can best be administered through the agency of a medical profession which has been thoroughly enlightened with regard to the practice of disease prevention, a profession which can become keenly alert to its responsibility and ably prepared to play its part in the conservation of the public health and welfare. Any health department which does not organize itself to make available through the office of the family physician the facilities now recognized as available to the modern health department is missing its opportunity. In Detroit, 1,100 physicians became actively interested in preventive medicine. The value of this addition to the roster of public health workers can easily be appreciated. Fundamentally, the problem is one of preparing the public for the service which may be rendered by the physician and at the same time preparing the physician to give the type of service to which the public is entitled."

The factors that have contributed most to the success of this program, as cited in this reprint, have been:

"First, continuous contact between the health department and the public health committee of the medical society, which has met weekly; second, postgraduate medical conferences in communicable diseases, which have been held weekly during the winter months; third, the employment of medical coördinators, who have visited in their office those physicians who never or seldom attend medical meetings of any character; fourth, the inauguration of a program of popular health instruction maintained by the health department, and, fifth, a system of home visitation and instruction of parents by public health nurses."

Charges jointly agreed upon between the Medical Society and the health department were one dollar for each dose of toxin-antitoxin or toxoid in all cases where, in the physician's judgment, the parent was able to pay for the service. The charge for the Schick test and reading of results was likewise one dollar, making a total charge of four dollars for the service. There was nothing in the plan to hinder the physician from charging his usual office fee if the patient appeared at any hour other than that specified in the agreement. It was further agreed that, when in the physicians' judgment the parent was unable or unwilling to pay, the health department should reimburse the physician at the rate of 50 cents for each treatment and one dollar for the Schick test, making a total of $2.50 for the complete service to each child.

OF GENERAL INTEREST

Dr. Ralph L. Parsons is located at Monterey, Minnesota, in general practice.

Dr. G. A. Hedberg of Canby, Minnesota, is house physician at Nopeming Sanatorium, Nopeming, Minnesota.

Dr. Morris Greenberg, a graduate last year at the University, is now in general practice at Wilton, North Dakota.

Dr. Meredith Hesdoffer has recently been appointed member of the staff of the Students' Health Service at the University of Minnesota.

Dr. Gordon E. Strate, St. Paul, following a residence appointment in the Eye, Ear, Nose and Throat department at the Ancker Hospital, has been studying in Vienna. He returned in November.

Dr. Brand O. Leopard has moved from St. Cloud, Minnesota, to Albert Lea, Minnesota, where he has opened offices in the Freeborn County National Bank Building.

At the annual meeting of the Central Neuropsychiatric Association, which was held in Buffalo, October 16 and 17, 1931, Dr. H. W. Woltman of Rochester was elected secretary-treasurer.

The marriage of Miss Marion Elizabeth Ashworth to Dr. E. J. Borgeson, both of Saint Paul, was solemnized Saturday evening, October 10, 1931. Dr. and Mrs. Borgeson, following a trip east, are now at home in Saint Paul.

Dr. S. M. Kirkwood, and family, of Baker, Montana, were recent visitors in Saint Paul, Minn., where Dr. Kirkwood practiced for nearly twenty-five years. Dr. Kirkwood with his wife and son stopped en route to Massachusetts, where they will make their home.

Dr. Carel C. Koch, Minneapolis, has been appointed as a member of National Advisory Commission on Vision for Motor Drivers' which was organized to cooperate with the national street and highway safety conferences inaugurated by President Hoover when he was secretary of commerce.

Physicians wishing to take part in the Scientific Exhibit of the annual meeting of the American Medical Association to be held at New Orleans next May should send in their applications to Thomas G. Hull, Director of the Scientific Exhibit, by January 20, 1932. Application blanks may be secured from the A. M. A. headquarters.

Appointment of Dr. F. E. Harrington, commissioner of public health, Minneapolis, as a member of the advisory board of the Health Research Bureau in the Women's Apparel Industry has been announced through the New York office of the organization. The bureau was formed to encourage healthful styles in women's apparel, according to Jerome Samuels, secretary.

Work on the remodeling of the E. J. Jones residence in Morris, Minnesota, into a hospital is under way. The project was established by a group of doctors and business men of Stevens County. Those at the head of the movement are Dr. E. T. Fitzgerald and Dr. J. F. Cumming, Morris, and Dr. M. L. Ransom, Hancock. When completed the hospital will accommodate eighteen patients.

Dr. L. A. Sukeforth of Duluth, public health director of that city for eight years, has retired from office. No successor has as yet been named. A plan for reorganizing the department, which will call for a full time specially trained supervisor as the department head, is being worked out by a committee of the St. Louis County Medical Society. Dr. A. J. McLaughlin, medical director of Chicago, has been named by the Bureau of Public Health, Washington, D. C., to assist the Duluth committee in reorganizing the department.

Dr. William J. Mayo of Rochester, Minn., was named president-elect of the International Assembly of the Interstate Postgraduate Medical Association at the meeting held in Milwaukee the latter part of October.

Dr. Arthur Dean Bevan, of Rush Medical College, Chicago, became president for the ensuing year. Other officers confirmed were: Dr. Charles H. Mayo, Rochester, and Dr. Edward Archibald, Montreal, heads of assembly clinics; Dr. William B. Peck, Freeport, Ill., managing director; Dr. Henry G. Langworthy, Dubuque, treasurer and director of the Foundation Fund; and Dr. George W. Crile, Cleveland, chairman of the program committee.

The nominating committee consists of Dr. E. M. Eberts, Montreal, chairman; Dr. B. J. Lee, New York; Dr. E. Starr Judd, Rochester, Minn., and Dr. Henry Christian, Boston, Mass.

Medical examinations for the unemployed are being utilized in Minnesota in an attempt to discover whether men and women who are frequently or generally out of work are suffering from physical disabilities that prevent their success as workers. This undertaking is part of the Minnesota Employment Stabilization Research Institute's work of making an intensive study of basic conditions of unemployment in Minneapolis, St. Paul, and Duluth. Mental tests and tests for vocational interests, trade skill proficiences, and personality traits are being given in addition to the medical examinations to four thousand unemployed individuals who have registered at the Institute headquarters at the University of Minnesota. Bulletins reporting the findings of this organization, which will also make a study of industrial conditions and public employment offices in the three cities, will be published by the University of Minnesota Press at intervals during the next two years.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

"NATUROPATH" SENTENCED TO FORTY DAYS IN COUNTY JAIL

State of Minnesota *vs.* Dana L. Hewett.

On October 16, 1931, Dana L. Hewett was arrested at Anoka, Minnesota, charged with practicing healing without a Basic Science certificate. Complaint was filed by Mr. Brist on behalf of the State Board of Medical Examiners. The defendant is a man about fifty years of age and maintained his office at 1807 First Avenue South, Anoka. The defendant was holding himself out to the public as follows:

> Remove the cause and nature will complete the work. Functional and organic diseases successfully treated.
>
> D. L. HEWETT
> Naturopath
>
> 1807 1st Ave. S., Anoka. Phone 544 J.
> Hours 9 A. M. to 5 P. M.
> Evenings and Sundays by appointment.

Following his arrest, Hewett waived his preliminary hearing and was held to the District Court under bond of $500. On October 21, Hewett entered a plea of guilty and was sentenced by the Honorable Arthur E. Giddings, Judge of the District Court, to a term of forty days in the county jail. The sentence was suspended and the defendant placed on probation on condition that he shall refrain from pacticing healing in the State of Minnesota. The State was represented by Leeds H. Cutter, County Attorney, and the defendant was represented by W. A. Blanchard, former State Senator from Anoka.

ST. PAUL MASSEUSE AND FORMER NATUROPATH SURRENDERS MASSAGE LICENSE

State of Minnesota *vs.* Schultz.

Mrs. Pauline L. Schultz, 633 Hamm Bldg., St. Paul, surrendered her massage license to the State Board of Medical Examiners on October 26, 1931. Mrs. Schultz, who claims to be a Naturopath, has been under indictment for manslaughter since last spring following the death of a St. Paul girl after an alleged abortion.

Mrs. Schultz has maintained offices in the Hamm Building for several years, where she has practiced under a massage license. The County Attorney's office, through no fault of its own, was unable to produce certain essential evidence in this case and it was therefore deemed advisable not to attempt a trial of the indictment. However, before the indictment was nolled on October 26, 1931, Mrs. Schultz advised the Board in writing that she was surrendering her massage license and closing her office. The office is to be closed on or before December 1, 1931.

CHIROPRACTOR GIVEN SIX MONTHS JAIL SENTENCE

State of Minn. vs. George F. Sjoden.

On November 12, George F. Sjoden, licensed chiropractor with an office at Kensington, Minnesota, was sentenced to six months at hard labor in the County Jail of Douglas County by the Honorable John A. Roeser, Judge of the District Court, for practicing medicine without a license. The defendant formerly practiced at Princeton and Motley, Minnesota. He has been prescribing medicine and attempting to remove tonsils. Complaint was filed against Dr. Sjoden by Mr. Brist, representing the State Board of Medical Examiners, before Sherman Costello, Justice of the Peace at Alexandria, Minnesota.

After having the Medical Practice Act and the Chiropractic Law very carefully explained to him, Judge Roeser suspended the sentence on condition that he pay the costs of the prosecution, that he refrain from practicing medicine in the future and that he keep the peace and be of good behavior. Dr. Sjoden, being licensed only under the Chiropractic Law of this State, has no authority whatever to prescribe medicine or remove tonsils.

Very splendid coöperation was received in the prosecution of this case from Mr. C. F. Hanson, County Attorney of Douglas County, and Sheriff Bennie Urness.

CHRISTMAS SEAL SALE

The annual Christmas Seal Sale for the purpose of raising funds to fight tuberculosis takes the stage this month.

It is significant of the healthy condition in which this Christmas Seal movement finds itself on the occasion of its 25th anniversary that it is not resting comfortably in old grooves, holding abandoned batte fronts.

As the National Tuberculosis Association, the Minnesota Public Health Association and all of their affiliated bodies in every state begin the 1931 campaign for funds, medical men will gladly acknowledge that they are in the vanguard in the education of the public to the newest epidemiological methods of control of tuberculosis and also in their national program of research into the nature of the disease.

This is the appeal which this movement makes to physicians, an appeal which sets it apart from many other benevolent undertakings. The National Tuberculosis Association is headed and managed by physicians and the Minnesota Public Health Association, its representative in Minnesota, is an active partner of the State Medical Association in the promotion of legitimate general health and anti-tuberculosis propaganda.

In that sense, the cause of the Christmas Seal in Minnesota is especially the cause of organized medicine and will, no doubt, receive the same staunch support this year that it has always received.

No one can doubt that reduced circumstances, meaning reduced scales of living, also mean reduced resistance to disease of all kinds, particularly tuberculosis. Among many emotional appeals for help for the unfortunate, this year, the sober appeal for more funds to fight tuberculosis will have a vivid reality in the minds of medical men. In most localities of the state, the Minnesota Public Health Association, with the authorization of the state and county medical societies and with their coöperation, has led in the important work of introducing and demonstrating the routine Mantoux testing of children. A threatened increase in the incidence of the disease will mean greater need than ever for this type of program which points the way toward discovery of infection at a time when it is possible to protect the child from active pulmonary disease.

Some interesting figures on comparative rates of tuberculosis infection in the towns and in the rural sections of Minnesota have come to light during the testing of the last year carried on both directly by the Christmas Seal organizations and indirectly in coöperation with the sanatorium districts of the state. In all, 30,000 tests have been made, mostly among other than known contact groups, with percentages of positive reactors running as low as six per cent in Ottertail County and 12.6 per cent in the city of Owatonna, on the one hand, and 25 per cent among city grade school children and 34.25 per cent among high school seniors tested as a group in Saint Paul.

Throughout the state these testing programs have discovered in all 70 unsuspected cases of open, active tuberculosis. The childhood type cases numbered 456. The number of cases discovered does not, of course, represent the whole value of the undertaking. To the home of each positive reactor went a warning of the significance of the reaction and a suggestion that the child see his physician, not only for a physical checkup but for help in discovering the source of the infection. This is practical education in tuberculosis control, a program in which the Christmas Seal organization will have the continued approval and coöperation of the medical profession.

OBITUARY

Daniel D. Murray

1859-1931

Dr. D. D. Murray, for forty years a practicing physician at Duluth, died November 6, 1931. Dr. Murray at one time was City Health Commissioner and for several years was medical examiner for the State Athletic Commission of Minnesota.

Frederick Barrett

1875-1931

Dr. Frederick Barrett, mayor of Gilbert for seventeen years, died suddenly at his home November 4, 1931.

Dr. Barrett, who was fifty-six years old, went to Tower in 1888 and also had lived at Eveleth before coming to Gilbert. He is survived by one son, John, a student at the University of Minnesota; a brother and two sisters.

Frederick J. Mitchell

1879-1931

Dr. Frederick J. Mitchell, Saint Paul, was accidentally shot while hunting near Albert Lea on October 8, 1931. Born at Rockland Center, Wisconsin, July 17, 1879, he studied medicine at Hahnemann Medical School, Chicago, and received his degree from Northwestern Medical School in 1909.

Dr. Mitchell practiced at Euclid, Minnesota, from 1903 to 1908, and had practiced in the Payne Avenue district of Saint Paul for twenty-two years.

Walter Henry Robilliard

1861-1931

Dr. W. H. Robilliard, seventy years old, died Sunday, November 1, 1931, at his home in Faribault, Minnesota. For thirty-five years a prominent practicing physician in Faribault, he also was an outstanding leader in civic and fraternal life.

Dr. Robilliard was a member of the Rice County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Surviving are his widow, two sons, Dr. Charles and Harold S.; a daughter, Mrs. Lyle Day of Minot, N. D.; and a sister, Mrs. H. S. Cleveland, of Minneapolis.

Reuben Nathaniel Palmer

1893-1931

Dr. Reuben N. Palmer, Kenyon, Minnesota, died Tuesday evening, November 3, 1931, as the result of a heart attack. He was thirty-eight years old. A graduate of the University of Minnesota medical school, where he was a member of Phi Beta Pi medical fraternity, he served his interneship at Ancker hospital, St.

Paul. Dr. Palmer began practice at Lanesboro, where he was located for about six years, moving to Kenyon only recently.

He was a member of the American Medical Association, Minnesota State Medical Association, secretary of the Houston and Fillmore County Medical Society, member of the Rice County Medical Society, Masonic lodge of Lanesboro, Kiwanis club, Izaak Walton league and First Futheran church of Kenyon. Dr. Palmer served in the medical corps in the World War.

He is survived by his wife; four brothers, George, Gunnar and Elder of Chisago City and Carl of Lindstrom; and two sisters, Anna and Astrid of Chisago City.

MISCELLANEOUS

THE SUPRACRICOID ADMINISTRATION OF LIPIODOL

Geoffrey Cottam, M.D.
Minneapolis

Each method of introducing lipiodol into the bronchial tree has its merits. In this brief communication, I wish to present the reliability and advantages of the above named route.

The various methods are:

1. Ochsner's cocain anesthetization of the pharyngeal ring with a resultant loss of the swallowing reflex. The patient is instructed to take a mouthful of the oil and tilt the head back. The lipiodol then runs down the trachea.
2. A method used by Pritchard whereby the oil is administered through a cannula placed between the vocal cords after laryngeal cocainization.
3. A type used in Graham's Clinic utilizes a glass syringe and a long needle. The tongue is pulled forward as the oil is dropped from the end of the needle on the back of the tongue. The oil overflows into the trachea.
4. The bronchoscopic administration.
5. Lastly, the supracricoid method in which a syringe and an ordinary "hypo" needle are used. The cricothyroid membrane is punctured and the medium injected into the trachea.

The technic of the latter operation is very simple. One half hour before injection, the patient's shoulders are lowered below the level of his hips and he is instructed to cough up all sputum. Introduction of oil on top of sputum may cause patches of bronchopneumonia. Twenty minutes before injection he is given ¾ of a grain of codein sulphate by hypodermic. He is then taken to the X-ray room and set upon a chair. The area over the throat is sponged with alcohol and a syringe full of lipiodol with a hypo needle is heated over a Bunsen flame. The cricoid is palpated and with one quick thrust through the skin and crico-thyroid membrane the needle enters just below the larynx. By pulling back on the plunger, air will enter the syringe if the needle is in the air passage. The patient is then tilted to the side of disease at an angle of 45° and he is instructed not to cough or swallow and to take short deep breaths like the panting of a dog. The oil is then introduced to a point where gurgling in the trachea is noticed. Warning the patient not to cough, the needle is removed and he is placed for an X-ray picture. Ten to 40 c.c. of lipiodol may be necessary.

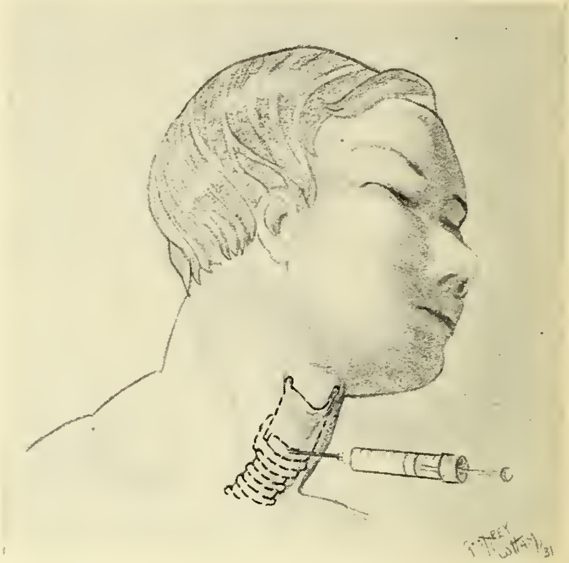


Fig. 1. For clarity the needle has been enlarged. This shows needle entering infra-laryngeal region through crico-thyroid membrane.

Upper lobe injections may be made by placing the patient on a table on the diseased side, with the feet down, at a 45° angle and when gurgling in the trachea is noted the table is inverted with the head down at an angle of 45° for one minute. The film is then taken with the table flat and the patient on his diseased side. The whole procedure takes but fifteen minutes.

The advantage over all the other methods is that it is always successful. Upper lobes may be injected with greater facility than with other methods. More adequate filling of the bronchial tree may be obtained. Patients who have had one of the other methods as well as the supracricoid, prefer the latter,—they do not mind the hypo needle as much as the gagging by the other methods. The only complication in the four years that I have been doing this work was a superficial infection in the neck, which readily yielded to hot wet dressings. The only contraindication is a septic lung (as pneumonia) or very active pulmonary tuberculosis. In low grade activity it may be used. Again, it can be done in much less time than that required by the other methods and there is not the annoyance of gastric disturbance from swallowing the oil.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of December will be as follows:

December 2—Diagnosis of Intussusception
December 9—Epilepsy Cures
December 16—The Tuberculin Test
December 23—Control of Communicable Diseases
December 30—Attitudes toward Cancer

THE AMERICAN COLLEGE OF PHYSICIANS

The Sixteenth Annual Clinical Session of the American College of Physicians will be held in San Francisco, California, April 4 to 8, 1932. The headquarters in San Francisco will be the Palace Hotel, where the general scientific sessions, registration, and exhibits will be held. Clinics will be conducted in various hospitals and institutions in San Francisco and nearby communities.

Dr. S. Marx White, Minneapolis, President of the College, has in charge the selection of speakers and subjects on the general program, while Dr. William J. Kerr, San Francisco, Professor of Medicine at the University of California Medical School, is the General Chairman of the Session, and is responsible for all local arrangements, in addition to the arrangement of programs and demonstrations. Following the San Francisco Session a post-convention tour will be conducted through Yosemite Valley, Southern California (with two days in Los Angeles), and the Grand Canyon of Arizona.

The attention of the secretaries of various societies is called to the above dates, in the hope that their societies will select non-conflicting dates for their 1932 meetings.

NATIONAL SOCIETY FOR PREVENTION OF BLINDNESS

The annual meeting of the National Society for the Prevention of Blindness will be held on Thursday, November 19, in the Russell Sage Foundation Building, 130 East 22nd Street, New York City, it is announced by Lewis H. Carris, Managing Director.

Dr. William Campbell Posey, of Philadelphia, Pa., a member of the Society's Board of Directors, will speak on "The Evolution of the Cataract Operation." Following this address a motion picture to demonstrate the cataract operation will be presented by Dr. Frank C. Parker, of Norristown, Pa.

Among other topics that will come up for discussion will be: Medical social service in eye hospitals and clinics, preventing eye troubles in babies, sight-saving classes for children with defective vision, trachoma research, prevention of industrial eye injuries, etc. Members and friends of the Society are cordially invited to attend.

MINNESOTA RADIOLOGICAL SOCIETY

A joint meeting of the Minnesota Radiological Society, the Iowa X-ray Club and the Radiological Section of the Wisconsin State Medical Society was held at the Mayo Clinic, Rochester, Minnesota, October 17, 1931. The Societies were honored by the presence of Dr. Charles H. Mayo, who delievered an address of welcome, and Dr. Lewis Gregory Cole of New York, who was the guest speaker. The following program was presented:

1. Round table discussion of gastro-intestinal diseases. Conducted by Dr. Lewis Gregory Cole, New York.
2. "Benign Tumors of the Stomach."
   Dr. Leo G. Rigler, Minneapolis.
   Discussed by Drs. L. G. Cole, J. D. Camp, C. G. Sutherland.
3. "Fractures about the Ankle Joint."
   Dr. M. S. Henderson, Rochester.
   Discussed by Drs. W. H. Ude and G. T. Nordin.
4. "Results of Radiation Therapy in Carcinoma of the Skin."
   Dr. L. G. Ericksen and Dr. K. W. Stenstrom, Minneapolis.
   Discussed by Drs. Gage Clement, Hamilton Montgomery and S. W. Harrington.
5. "Intrathoracic Tumors."
   Dr. S. W. Harrington, Rochester.
   Discussed by Drs. C. H. Mayo and L. G. Rigler.
6. "Tuberculosis in Children."
   Dr. T. A. Burcham, Des Moines.
   Discussed by Drs. E. S. Hewitt, Arnold Anderson, L. G. Rigler.
7. "Bone Changes in Hyperparathyroidism."
   Dr. John D. Camp, Rochester.
   Discussed by Drs. J. deJ. Pemberton and R. M. Wilder.

Following the banquet the principal address of the meeting, "Correlation of the Roentgenologic Appearance with the Pathologic Changes of Gastric Ulcer," was delivered by Dr. Lewis Gregory Cole, New York.

Leo G. Rigler, M.D., *Secretary,*
Minnesota Radiological Society.

IOWA STATE MEDICAL SOCIETY

An invitation has been extended through the Secretary of the Iowa State Medical Society, Dr. Robert L. Parker, to the members of the Minnesota State Medical Association to attend the annual meeting of the Iowa State Medical Society which is to be held at Sioux City on May 4, 5 and 6, 1932.

MINNESOTA SOCIETY OF INTERNAL MEDICINE

At the semi-annual meeting of the Minnesota Society of Internal Medicine the following officers were elected: Henry L. Ulrich, president; H. Z. Giffin, vice president; Moses Barron, secretary-treasurer. The next meeting will be held at Duluth in June, 1932.

SOUTHWESTERN MINNESOTA SOCIETY

The Southwestern Minnesota Medical Society met at Slayton, Minnesota, October 6, 1931, for the semiannual meeting. Dr. W. G. Benjamin, Pipestone, Minn., and Dr. S. A. Slater, Worthington, Minn., lectured on their experiences in visiting medical clinics of Europe.

The following officers were elected for the ensuing year: President, Dr. S. A. Slater; vice president, Dr. J. T. Rose; secretary-treasurer, Dr. E. G. McKeown.

The following censors were re-elected for a period of three years: Dr. A. H. Brown, Pipestone County; Dr. C. O. Wright, Rock County; Dr. J. H. Dudley, Cottonwood County.

E. G. McKeown, M.D.
Secretary.

STEELE COUNTY SOCIETY

At the annual meeting of the Steele County Medical Society held October 13, 1931, the following officers were elected for the ensuing year: President, J. A. McIntyre, Owatonna; vice president, E. W. Senn, Owatonna; secretary-treasurer, D. H. Dewey, Owatonna; censor for three years, J. F. Smersh, Owatonna; delegate to state meeting, A. B. Stewart, Owatonna; alternate, E. J. Nelson, Owatonna.

These officers will assume office at once.

WEST CENTRAL AND KANDIYOHI-SWIFT SOCIETIES

The West Central and Kandiyohi-Swift County Medical Societies held a joint meeting at Morris, Minnesota, October 14, 1931. A banquet was served at the La Grande Hotel. After dinner Dr. Emil Geist of Minneapolis gave a very interesting moving picture lecture on "The Treatment of Fractures."

Officers elected for the following year are: Dr. N. F. Doleman, Tintah, President; Dr. B. Karn, Ortonville, Vice President; Dr. A. L. Lindberg, Wheaton, Secretary-treasurer.

A. L. Lindberg, M.D., *Secretary.*

WASHINGTON COUNTY SOCIETY

The monthly meeting of the Washington County Medical Society held October 13, 1931, was well attended. The outstanding features of the program were lectures by the guest speakers, John C. McKinley, M.D., Professor of Nervous and Mental Diseases at the University of Minnesota, and Wallace Cole, M.D., Saint Paul. The subject was "Infantile Paralysis." Dr. McKinley covered the medical aspect of this disease, its probable cause, early recognition and attempts at prevention and treatment. Dr. Cole took up the prevention and treatment of deformities, illustrating with lantern slides.

The evening was most profitable and enjoyable.

E. Sydney Boleyn, M.D., *Secretary.*

THE MISSISSIPPI VALLEY CONFERENCE ON TUBERCULOSIS

The joint annual meeting of the Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association which met this year in Saint Paul in September, showed a registration of some five hundred individuals from twelve Mississippi states. The large proportion of those in attendance from outside the medical profession indicates the widening social aspect of the anti-tuberculosis activities of today. Social service, city and county problems, out-patient clinics—all had their share in the program.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

MINNESOTA STATE AUXILIARY

Wednesday morning, October 28, the executive board of the Minnesota State Medical Society met with the president, Mrs. James Blake. After the business session, Dr. C. B. Wright gave an interesting talk on "The Conduct of the Veterans' Bureau as It Pertains to Hospitalization and Medical Care." Following the meeting a luncheon was served with Mrs. McGlothlan, national president, as guest of honor.

HENNEPIN COUNTY AUXILIARY

The Woman's Auxiliary to the Hennepin County Medical Society gave a reciprocity tea, October 28. The presidents and members of the county societies throughout the state had been invited and about seventy-five attended. Mrs. Arthur McGlothlan of St. Joseph, Missouri, national president of the Women's Auxiliary to the American Medical Association, was guest of honor. She gave a brief address sketching the work and ideals of the national group.

RAMSEY COUNTY AUXILIARY

The executive board of the Ramsey County Auxiliary entertained at a luncheon, Thursday, October 29, in honor of Mrs. McGlothlan, national president. Other guests were Mrs. James Blake, state president, Mrs. Martin Nordland, president of Hennepin County Auxiliary, and Mrs. Hugh Tunstead, president-elect of Hennepin County. The same evening Mrs. Hesselgrave, past state president, entertained at a dinner in honor of Mrs. McGlothlan. The guests included the executive board of the Ramsey County Medical Auxiliary and the past presidents of the State Auxiliary and Mrs. James Blake, state president.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of October 14, 1931

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 14, 1931. After the dinner at 7 p. m., the meeting was called to order at 8:15 p. m. by the President, Dr. J. S. Gilfillan.

There were 45 members and 2 visitors present.

Minutes of the May meeting were read and approved.

Dr. Moses Barron, who was announced to read his Thesis at this meeting, was unable to be present. So arrangements had been made to have

Dr. Max Hoffman, St. Paul, read his Thesis entitled "Observations in the Diagnosis of Gallbladder Disease."

DISCUSSION

Dr. Arnold Schwyzer, St. Paul: I think it would be healthful for most surgeons if their material were gone through by somebody else in an impartial way without the surgeon trying to "have a finger in the pie." From what date to what date were those cases taken?

Dr. Hoffman: From 1926 to 1930.

Dr. Schwyzer: How many deaths?

Dr. Hoffman: One. This patient died two weeks after the operation from pneumonia.

Dr. Schwyzer: One point is that the diagnosis cannot always be made absolutely even with the Graham-Cole test; there will away be a few cases where we don't know whether we do the right thing in taking out the gallbladder or leaving it in. We also will have a few cases that will not turn out right. In the X-ray examination, I know we sometimes differed; Dr. Hoffman had his ideas about the case, and I had mine, but I must admit his percentage of correct diagnoses was larger than mine.

He mentioned among the symptoms—and I think that is one of the most important for the surgeon to go by—that if the pain is in the first part of the night the patient may have duodenal ulcer, but if the pain comes after 2 o'clock in the morning it is practically always a gallbladder case. About 20 years ago Rutherford Morrison of England made this statement, and I do not think it ever failed me.

Dr. A. T. Mann, Minneapolis: This has been a very well worked out paper and well given; it deserves more discussion. In my experience a great many of these cases do have stomach symptoms which are often mistaken for ulcer of the stomach or duodenum and some other things, and I have been very much interested in trying to unweave some of the characteristics of these symptoms. It seems to me that with the ulcer symptoms the symptoms are apt to be worse in the spring and fall, and when similar symptoms come from the gallbladder it is not at those times but they are more apt to come in the winter and summer. So the point of incidence is different.

Then when we come to the foods which make the symptoms worse, for ulcer we have a whole list of things which are well-known—sugars, acids and fatty foods. It seems to me that usually when you have an ulcer and there is a type of food which makes it worse there is a whole list of the same type of foods that make it worse; but if it is the gallbladder there may be only one, perhaps two, which make it worse, but not the whole list. I have had cases where it was apple sauce which made the symptoms worse, and the patient could eat other things all right; or in other cases it may be something else. Usually if you go into these histories carefully, you can find there are one or two foods which tend to upset the patient and make him worse, whereas if the condition were ulcer you could expect a long list of that class of foods to make it worse.

There was a large incidence of stones in these cases. I believe there are a good many without stones that have so much disease in the gallbladder that they have very definite symptoms and they get relief after operation. Now, how are we going to get at those cases? You do not see stones in the X-ray; you may see change of function with the dye tests, and you will have as a rule the digestive disturbances. But, as a rule, if the case approaches a situation where surgical removal should be done, we have usually a pretty definite point of tenderness in the gallbladder region just as we do in the appendix region in appendicitis.

In my own mind, I formulate it something like this: If we have symptoms that might be reflex symptoms from the stomach and we have a patient who has disability from that so that he cannot do his work and, in addition to that, we do get the tenderness over the gallbladder, those cases I think are surgical.

Dr. C. B. Wright, Minneapolis: I would like to express my appreciation of this paper. The careful analysis of so large a series of cases operated on by a surgeon whose conservatism is proven by the large number of cases which showed advanced pathology, is of real clinical value.

In regard to the question of gastric acidity in gallbladder disease raised by Dr. Hoffman, it is true that there are different opinions expressed in the literature. I believe, however, it is fairly generally conceded that in old gallbladder cases showing advanced pathology the acids are lower and frequently absent.

Old gallbladder cases constituted quite a large percentage of some 175 cases showing no free HCl in the stomach with the fractional meal, a third of the cases failing to respond to histamine. I believe there is some connection between functionless gallbladders and achlorhydria. I have observed cases in which acid was present before the removal of the gallbladder and disappeared afterwards. This is not an unusual finding.

Gagschat showed experimentally on dogs that removal of the gallbladder produced entire absence of gastric acidity which persisted at least one year.

One must remember the fact, however, that approximately 30 per cent of people over 60 will show absence of free HCl with the ordinary test meal and in gallbladder disease we are dealing with a fairly old group as a rule.

Dr. Hoffman also speaks of one case with right lower quadrant pain. I would like to know how he explains a pain in this region due to the gallbladder.

Dr. A. W. Ide, St. Paul: I would like to ask Dr. Hoffman whether or not any symptoms were observed from the use of this dye? It has seemed to us that it is better to delay operation in these cases until there is time for the dye to be eliminated. We have observed that cases operated upon soon after the dye was given had a rather stormy time for a while after the operation.

Dr. A. A. Zierold, Minneapolis: I wish to congratulate Dr. Hoffman on his paper. Whenever the subject of gallbladder diagnosis and treatment is offered, internists and surgeons alike feel free to discuss it at length; possibly because there is so little exact knowledge available. From Dr. Hoffman's paper it seems that a question may be raised as to the identity of gallbladder disease. We may identify as suffering from gallbladder disease (1) that patient experiencing qualitative food distress, abdominal discomfort, belching, etc.; (2) that patient whose gallbladder fails to conform to the limits of the Graham-Cole test; (3) that patient whose gallbladder on microscopic examination is abnormal. As these findings are not commonly present in all cases it would seem reasonable that diagnosis be limited and directed to but one of the three groups. Dr. Wright has mentioned a point which has been of particular interest to me because of some observations which we have been making at the Minneapolis General Hospital. It has been noted for some time that abnormal gallbladders, particularly those with obstruction of the cystic duct, are frequently accompanied by functional achlorhydria. For the past year or more we have been doing routine fractional determinations of the stomach content on all gallbladder cases coming to operation. We have found, as was to be expected, that the majority of these cases showed free hydrochloric acid only upon the exhibition of histamine. Following operation, further study of the gastric content was made at stated intervals, and with few exceptions the functional achlorhydria disappeared with removal of the gallbladder. If, on further observation, these findings proved constant, it would appear reasonable to believe that some of the symptoms attributed to gallbladder disease *per se* are really disturbances of secretion and, consequently, motility of the stomach. It might also be reasonable to assume that routine examination of the stomach content might aid in determining the prognosis of gallbladder operations.

Dr. H. B. Sweetser, Minneapolis: In connection with the complications which occur in gallbladder disease, I would like to mention a case which recently came under my care:

Nearly a year ago I was called by a physician about midnight to see a patient, who had been, earlier in the evening, suddenly stricken with extreme pain in the epigastrium and was in shock. At operation was found an acutely inflamed gallbladder full of stones, but also an enlarged and hard nodular pancreas, together with many areas of fat necrosis in the large omentum. We removed the gallbladder, and the patient recovered and left the hospital, but did not do well and continued to complain. About two months ago the patient again came under observation and now, on examination, presented a large tumor mass in the epigastrium, which at operation proved to be a cyst of the pancreas. Because of the relationship of pancreatitis to inflammation of the gallbladder and its dependence thereon, I have wondered if, at our first operation, had we drained the gallbladder instead of removing it, the pancreatitis might have subsided without such cyst formation.

Dr. A. Schwyzer, St. Paul: That lumpy condition of the pancreas we find quite frequently in cholecystitis and I think it usually disappears with a cholecystectomy. I think it is secondary to the infection from the gallbladder. I remember one case that had a regular pyramid formed by the swelling of the pancreas. That was many years ago when we did not take out the gallbladder as a routine in these cases. In that case we took out the stones and drained the gallbladder and the patient was quite well for probably nine months, then began getting worse again. There were no stones this time, and yet this great swelling in the head of the pancreas had formed again. I figured that the patient had a persistent cholecystitis, and so took out the stoneless gallbladder, and the patient has remained well since. That swelling in the head of the pancreas we could feel through the flabby abdominal walls. I think Dr. Sweetser did the right thing in his case.

Dr. A. E. Benjamin, Minneapolis: There are other diseases or complications that present symptoms similar to gallbladder trouble. I have seen individuals with prolapse of the stomach and colon which gave symptoms that resembled gallstones and were so diagnosed, but when they came to the hospital for investigation it was found that a kink existed in the hepatic flexure of the colon. Colitis and pericolitis associated with gallbladder disease may modify the symptoms considerably.

Dr. Hoffman, in closing: I want to take this opportunity to thank the members of the Academy for the privilege of presenting this paper, and especially the members who were kind enough to discuss it.

In answer to Dr. Wright's question, I don't know just why the pains occur in the right lower abdomen. We know there is a frequent association between gallbladder disease and appendicitis, and some of our patients had that combination, but just what the percentage is I do not know. We very frequently see in the cholecystogram that the gallbladder is very low in the pelvis. The difference of opinion regarding stomach acidity in gallbladder cases shown in a number of reports, some indicating hyperchlorhydria and some an achlorhydria; but many of the reports indicate that there is no change or decrease in the acid. I was glad to hear the statement that after the removal of the gallbladder there was a diminution of the free acid because that might account for our three patients who had diarrhea.

Dr. Ide asked about the reaction from the dye. When we first started making the cholecystograms we used the dye in capsules and we had quite a lot of trouble;

the patient would call us up in the night and tell us he was having a great deal of nausea and vomiting. But since we have been using the emulsion and grape juice we have had very little trouble. Occasionally there is diarrhea with nausea and vomiting, but none of the patients get very sick. I don't know what effect it would have on the patients to operate on them soon after taking the dye; usually they are operated on quite a while after taking the emulsion.

Dr. Martin Nordland, Minneapolis, read a paper on "The Relief of Pain in Advanced Tuberculosis of the Larynx by Means of Surgery." This was illustrated with lantern slides.

ABSTRACT

The relief of pain in far-advanced tuberculosis of the larynx is important because, as a result of pain, there is a diminished intake of food and rapid failing of the patient. The author has had the opportunity of bisecting the superior laryngeal nerve five times for this purpose.

Applications of various remedies to the ulcerated surfaces have never been satisfactory.

Injections of alcohol into the superior laryngeal nerve, for the relief of pain, has many disadvantages. Among these are: the varied experience of the operators; the relief of pain is only transient, varying from a few hours to six weeks; repetition is difficult on account of connective tissue formation; the pain of recurrence is often more severe than the original pain; and because there is occasional paralysis of the tongue due to the extension of the alcohol to the hypoglossal nerve.

Bisection of the internal branch of the superior laryngeal nerve is recommended as the surest method of relieving dysphagia, because it is simple, without technical difficulties, has no contraindications and because it partially immobilizes the vocal cords as well as relieves the pain.

The anatomy to be considered is the same as that for ligature of the superior thyroid artery, because the superior laryngeal nerve is so closely related to this artery.

The operation is done after using a few cubic centimeters of two per cent novocain, after the patient has been put in the same position as for thyroidectomy.

After the operation all painful sensation upon swallowing food disappears immediately. When pain persists after the resection of the superior laryngeal nerve, it can be assumed that the ulceration is not confined to the larynx.

The operation has a definite symptomatic value and may have a curative possibility.

The operation is suitable for other painful inflammatory processes in the larynx.

DISCUSSIONS

Dr. F. L. Jennings, Oak Terrace (by invitation): Tuberculosis of the larynx is a secondary condition and usually occurs with advanced tuberculosis of the lungs. The marked soreness and painful swallowing that Dr. Nordland has spoken of is the result usually of extensive disease in the larynx. I have here two models which show extensive tuberculosis of the larynx and it is in lesions similar to these that patients suffer so much.

I was familiar with the previous work of Dr. Nordland in which he had shown that there were motor fibres in the superior laryngeal nerve and therefore watched two of the cases on which he had sectioned these nerves to see if there were any changes in the movements of the larynx, but the destruction in both of these cases was so great that I was not able to see any difference. However, we have known for a long time that the superior laryngeal nerve is largely a sensory nerve and the pain and discomfort which our patients with extensive lesions of the larynx suffer is intense. Anything which will relieve the painful deglutition which these patients encounter is a justifiable procedure.

I have tried alcohol injection of the superior laryngeal nerve by every technic which I have been able to get hold of, but my results have been uniformly unsuccessful, which is quite in contrast with the results which Dr. Nordland has obtained by sectioning the nerve. The operation is a simple one. The incision is small and heals quickly. It is our practice to remove the skin clips 36 to 48 hours after operation and bridge the incision with sterile adhesive. All of these operations were on advanced, moribund cases of tuberculosis, nevertheless the wounds healed by primary intention.

Dr. A. Schwyzer, St. Paul: This operation is exceedingly well conceived, and it surely is a great boon for our cases. I am only sorry that I did not think of this myself years ago. If one has seen how much these patients suffer and how they are afraid to eat, then to have this relief and the improvement in nutrition which would follow, one cannot help feeling that this is the best thing for such cases. I have at one time used alcohol injection, but the result was transitory. In one case I removed the larynx. You have to be sure that you haven't much involvement in the lung. In the case in which I removed the larynx, it was too much for the patient, for he gradually went down anyway afterwards. As to the technic the doctor uses in his cases, I wondered, when I saw how he proceeds, whether one could not make a median incision between the hyoid bone and thyroid cartilage; one would simply have to go through the sternohyoid muscle and then, by going along the thyrohyoid ligament on both sides, you could get the nerve with great ease as it is the only strand entering this ligament.

Dr. E. K. Geer, St. Paul: I think this procedure has a very definite place in the treatment of ulcerative laryngeal tuberculosis, although a small one. I have used it once (Dr. Colvin doing the operation) on one side on a patient in whom I had been successful with alcohol injection on the other side. Of course, we should not use resection of the superior laryngeal nerve at first because in the majority of cases we can get enough relief by vocal rest, light treatment and applications of local anesthetics such as anesthesin in mild cases and cocaine in severe ones.

Dr. Nordland, in closing: There is just one thing I neglected to mention. This procedure can be used for other things than tuberculosis. It is particularly valuable in relieving the pain from other inflammatory processes, and in carcinoma which invades the larynx.

Dr. Arnold Schwyzer reported a case of ligation for aneurysm of the innominate artery upon which he had operated 22 years ago, and just recently learned that the patient is still living and well.

The meeting adjourned.

R. T. LaVake, M.D.
Secretary.

PROCEEDINGS OF THE MINNEAPOLIS SURGICAL SOCIETY

Meeting of October 1, 1931

The regular monthly meeting of the Minneapolis Surgical Society was held in the Lounge on the 20th floor of the Medical Arts Building on Thursday evening, October 1, 1931.

The meeting was called to order at 8 p. m. by the President, Dr. J. Frank Corbett. There were 26 members and 7 visitors present.

Minutes of the May meeting were read by the Secretary and approved as read.

After a short business meeting, the following scientific program was presented.

Dr. William A. Hansen gave a talk, illustrated with slides, on "The Anatomy of the Breast with Special Reference to the Lymphatics."

Dr. O. J. Campbell read his Inaugural Thesis entitled "End Results of Eighty Carcinomas of the Breast Treated by Radical Operation, with or without X-ray." (To be published in full in a later number.)

ABSTRACT

The paper consists of an analysis of the nature of the material and the end-results obtained in all carcinomas of the breast treated at the University Hospital between the years 1916 and 1928, by radical operation with and without postoperative X-ray therapy.

Out of eighty such cases, there were two males, an incidence of 2.5 per cent as compared to 1 per cent reported by Judd and 1.2 per cent by Pack and Pfahler.

The age incidence is given by table and the maximum found to be in the fifth decade, corresponding to the findings of others. None was under thirty-five or over seventy-five. The incidence of cancer in the young is discussed briefly.

There was an incidence of 7.7 per cent single, 28.2 per cent widowed, and 64.1 per cent married women. In seven there was an indefinite history, and in two a definite history of trauma. Previous breast lesions include four cases of chronic mastitis, two of breast abscess and one each of galactocele, "caking," and benign tumor.

The initial symptom was, in 57.5 per cent, the discovery of a lump, and in 25 per cent, pain. Other symptoms are listed in order of frequency.

A definite preponderance of cancers was noted in the left breast. A table is given for comparison with other reports. The percentage of lesions occurring in the various portions of the breast is given and compared to the findings of others.

The element of delay is discussed in some detail. The mean alleged duration of symptoms for all cases was 19.3 months. When cases of over three years' duration were eliminated, the average dropped to 9.9 months. The average delay occurring between the first consultation with a physician and the beginning of treatment was 4.8 months. In the eleven cases in which poor advice was given the average delay was 12.6 months.

An operative mortality of 3.75 per cent was analyzed and compared to other reports. Of the seventy-seven cases surviving operation, seven have been listed. Follow-up information on seventy cases was available. Because of the method used in tracing patients it was thought safe to consider the lost cases as showing at least as favorable results as the traced cases. The results are therefore analyzed in detail on the basis of the traced cases only, but the totals are also given in relation to the whole material traced or untraced.

Cases were grouped as follows:

Group I. Local tumor without skin or fascial attachments; no glandular involvement on pathological examination.

Group II. Local tumor without skin or fascial attachments; glands involved.

Group III. Skin and fascial attachments; glands involved.

Group IV. Supraclavicular or remote metastases.

There were 23 per cent in the first group, 37 per cent in the second, 33 per cent in the third, and 7 per cent in the fourth.

The results are tabulated as three-year, five-year and ten-year survivals for each group.

Based on available cases only, there were 48.6 per cent three-year, 38.8 per cent five-year, and 24 per cent ten-year survivals.

Based upon total material there were 44.2 per cent three-year, 34.5 per cent five-year, and 22.2 per cent ten-year survivals.

The relationships between delay and results, and between location in the breast and results, are shown by table.

Fifty-nine of the seventy cases were graded according to Broders' classification. A comparison between grade and end-results is shown.

Comparison of results between the present series and other reported series are rendered in tabular form.

Dr. W. A. O'Brien, Pathologist at the University Hospitals, had been invited to give a paper on "The Pathology of Carcinoma of the Breast."

Dr. K. W. Stenstrom, of the department of Radiology at the University Hospitals, had been invited to give a paper on "Radiation Therapy in Carcinoma of the Breast."

DISCUSSION (on four papers)

Dr. A. T. Mann stated he had been greatly interested in some of these questions in regard to cancer of the breast. One point is the pre-operative use of X-ray, and he recalled a patient sent him from New York who had been operated on by one of the best men in New York City, whose statement was that he thought they were getting better results if they did not use pre-operative X-ray. In studying the question a little, Dr. Mann thought possibly the idea is this. As he understood it, X-ray and radium have effects which vary according to the depth of penetration; that is, if one put an X-ray dose onto a tumor and took it away too soon its first effect would be to stimulate that tumor. Then if it was applied more, the effects would be deeper. The effect at the tumor itself would be a destructive dose, but deeper in the tissues it would be an irritative dose. If secondaries are present it is possible that they may be receiving an irritative dose and be stimulated rather than killed; whereas, if there are no secondaries then pre-operative treatment with X-ray might be of value. Dr. Mann said he did not know whether that is really the case, but it seemed that there are several series of statistics which show that the results where the secondary nodes were present are better when the pre-operative treatments are not given.

Dr. Mann called attention to another interesting point and that was the suggestion by Bower and Clark of Philadelphia of taking an impression of the breast, similar to taking finger prints, pre-operatively, of course. Dr. Mann felt that if we could get any information before operating, that the growth is or is not malignant, we have gone a long ways. These men suggested making a print of the breast, which they did in a large series of cases, and in studying them they were surprised to find things on the print which they had not seen with the eye. Most of the skin is different when the tumor is older and they felt that there might be and was something of help in this procedure. Their observation was that in the cases in which there was carcinoma they very often detected that the ridges and sulci, the pores, and the arrangement of the skin were changed, but that where the case was benign those changes were absent. Dr. Mann stated that he merely gave this for what it is worth. He did not know much about it, but it would be good for teaching purposes, and one could file these prints away and have them on record.

Dr. Mann said he was rather disappointed that the clinical index of malignancy did not seem to work out so very well, for on the face of it it is very attractive. Dr. Lee makes the factors which he knows the weighing factors and gives them the following values: Age: 2; lactation, 3; rate of growth, 4; extent of growth, 5; and then modifies that by certain multiples:

The age, if over 55, he put down as 1, *i.e.,* 1 × 2 = 2.
If between 40 and 55 he put it down as 2, *i.e.,* 2 × 2 = 4.
If under 39 or 40 he put it down as 5, *i.e.,* 5 × 2 = 10.
Lactation, if not present, would be 0.
Lactation, if present, he put down as 3, *i.e.,* 3 × 3 = 9.
The rate of growth, if slow, moderate, or rapid, he would put down at 1, 2 and 4, *i.e.,* 4 × 1, 4 × 2, or 4 × 4.
The extent, if below 3 cm. (1 to 0.2 inches) would be first; if over that it would be the second, and if nodes are present, the third. The modifying factors would be 1, 2 and 4.

And he could get right down in figures a very good scale, making his first ones of slight malignancies up to 25 points. The lowest possible points equal 11, and the highest 55. He took up to 25 for his A series, and from 26 to 39 his B series, and from that on up for his C series and tested these out with studies on his old cases. The article Dr. Mann mentioned was the result of a study of 100 cases. His A series had about sixty-eight or sixty-nine patients living at the end of five years, the B series thirty-four, and the C series only one patient.

Dr. H. B. Sweetser stated that first of all he wished to congratulate the program committee and the essayists for a most interesting meeting.

As regards diagnosis of cancer of the breast, he felt sure that one, after having seen and operated on a number of cases, can make a correct diagnosis in almost every case clinically by palpation, and after operation by gross section without microscopic verification, although this, of course, should be done.

Concerning grading as to the degree of malignancy, he was sure that this information should not influence one as to the character or extent of the operation. If the case is cancer, irrespective of type, it should have as extensive and radical an operation as possible; if extension has not gone beyond the reach of surgery, either permanent cure or a great prolongation of life will result. Because some surgeons try for a good cosmetic result, they are liable to remove too little skin and fascia and so have recurrences which might be avoided. When operating, one should forget entirely cosmetics, and if unable to approximate the skin edges, even after extensive undermining, should allow healing by granulation and subsequent grafting. From the standpoint of scientific surgery grading of every cancer is very essential, but from the standpoint of results in the prolongation of life, the type of operation is most important.

Dr. A. A. Zierold stated that both Dr. Campbell and Dr. O'Brien mentioned a point which they had in common and which Dr. Sweetser also mentioned in his discussion, namely, the grading of these cancers. Apparently from the first work done, particularly on cancer of the lip, this proved to be a rather accurate method. From Dr. Campbell's analysis, which has been a very careful analysis even though the series is short, and from what Dr. O'Brien has shown, Dr. Zierold felt that the question might be raised as to whether they were not merely reclassifying cancer on its morphology rather than on its behavior.

In employing the phrase "grade of malignancy" the implication is that the clinical behavior of the tumor is identified according to variations in cell structure. If the method be sound, it would appear reasonable that the behavior of a tumor of a certain grade should be uniform irrespective of the type of treatment employed.

Thus, if Grade IV, which by classification is very active, is radio-sensitive and disappears under this form of therapy but is resistant to surgery, the system of grading fails as a basis of prognosis and again becomes another system of classification.

Dr. Campbell, in response to Dr. Mann's expression of disappointment over the prognostic value of Lee's clinical index, stated that he did not wish to create the impression that the clinical index was not accurate. He felt that, unless the patient was lactating or was very young, the prognosis was equally well reflected in the presence or absence of axillary metastases. Group I cases corresponded to Lee's least malignant group while Groups II, III, and IV corresponded to Lee's group of average malignancy. He said it is almost impossible to get into the most malignant group unless metastases have occurred and unless the patient is either very young or lactating. None of the cases in Dr. Campbell's series fell in this most malignant group.

Dr. Campbell stated that while in the hands of certain individuals the grade of malignancy of breast cancers may closely correspond with the ultimate results, in his series the grade of malignancy as determined by Dr. Randall attempting to use Broders' methods and criteria did not in the least agree with the clinical outcome and was valueless as an index to prognosis.

Dr. R. C. Webb asked how many different surgeons operated on these patients.

Dr. Campbell stated that there had been several but that the operation was standard and varied only as to the type of incision used.

Dr. J. F. Corbett asked what a "radical operation" is and

Dr. Campbell replied that such an operation consisted in the removal of fat and lymph glands of the axilla, pectoralis major and minor muscles, breast, a generous portion of fascia and the upper part of the anterior rectus sheath. No attempt is made to remove supraclavicular nodes. The operation starts in the axilla and finishes at the rectus sheath, all tissues being removed in one block.

Dr. Campbell added that, while he did not mention the point in his paper, it might be well to recall a teaching of Dr. Bevan that the cancer should occupy the center of the block of tissue removed. A great many surgeons will remove the breast without regard to the position of the tumor. If there is anything to the theory that cancer extends by lymphatic permeation, the surgeon is likely to cut through involved lymphatics unless he uses the cancer as the center of the block. The closer a cancer is to the periphery of the breast the greater will be the amount of skin which must be removed.

Dr. K. W. Stenstrom stated that the question of stimulation from radiation is an old one and has been threshed out a number of times at various meetings. A number of years ago it was assumed to stimulate the growth and experiments were carried out on a small scale and these seemed to agree with that assumption. Then those experiments were continued on a larger scale and no stimulation was obtained. Dr. Stenstrom said, so far as he knew, there has been no actual stimulation of tumor growth in patients. Of course one cannot deny the possibility of it, but it seemed to him that if it were present we should see poorer results than we do from the use of radiation. When they have a far advanced case they always give some of the metastasis a small dose and still those patients live a little longer, according to statistics, than do those untreated.

Dr. Stenstrom said he wished to call attention to another theory which was just the opposite, and that is that if one treated one part of the tumor a defense was set up against the rest of the tumor. Some experiments were done by Caspari, Opitz and others in which the whole mouse was irradiated except the tumor area and they noticed in some of the experiments that the tumor decreased, but Dr. Stenstrom felt there was very little to that theory with respect to the tumor in humans. He felt that now the majority of radiologists feel that there is no direct stimulation to the growth, and the so-called stimulation obtained in certain diseases might be some kind of indirect stimulation.

The President closed the meeting by extending the thanks of the members of the Society to the visiting essayists who contributed to the program.

The meeting adjourned.

H. O. McPheeters, M.D., Secretary.

MINNESOTA PHYSICIANS—ATTENTION

This is to request respectfully that patients be not sent to the University Hospital unless the hospital has been called by you, and the hospital has agreed to accept the patient. Lately, some of the doctors have been sending patients without such notice. This, of course, is unfair to patients. The hospital is crowded, and is unable to accept patients unless we know they are coming.

In fairness to the patient, we request that you comply with our wishes in this matter.

Paul H. Fesler, *Superintendent.*

PERNOCTON NOT ACCEPTABLE FOR N.N.R.

Pernocton, stated to be a 10 per cent solution of the sodium salt of the secondary butyl-beta-bromallyl barbituric acid, was submitted to the Council on Pharmacy and Chemistry by Riedel-de Haen, Inc. The product is proposed for intravenous injection for production of "Pernocton sleep." Since the name is therapeutically suggestive, the firm proposed to replace it with "Pernoston" and requested consideration of the product under the latter name; however, advertising as late as May, 1931, still bears the name Pernocton. The Council on Pharmacy and Chemistry declared the name Pernocton therapeutically suggestive and held the product, whether marketed as Pernocton or Pernoston, unacceptable for New and Non-official Remedies for lack of critical evidence that routine intravenous injection of potent narcotics is desirable or safe. (Jour. A. M. A., October 3, 1931, p. 1001.)

CONSULTATION BUREAU

Wm. A. O'Brien, M.D., *Director*

Minnesota State Medical Association
11 West Summit Avenue
Saint Paul, Minnesota

This service will be discontinued January 1, 1932, by action of the Council at its last regular meeting, October 30, 1931.

1. *Question.*—I have an old man with osteomyelitis of the clavicle near the shoulder joint. It has persisted for about two years, with a small amount of discharge and an occasional passage of a few spicules of bone. I would like to try the maggot treatment on him and wish to know where I may obtain the eggs.

   Answer.—Maggot eggs may be obtained from Lederle Laboratories (New York) in bottles of 1,000 each. As it takes approximately eight or nine bottles for a course of treatment, the cost is about sixty dollars for the series. The eggs are implanted in the wound, the entire content of one bottle being used for a treatment. It is necessary to renew them at about five day intervals, before the pupa stage is reached. The treatment is harmless and frequently successful. The usual treatment of osteomyelitis of this type is subperiosteal resection of the diseased area. It is usually successful and is recommended. The maggot treatment was described in detail in the July issue of the Journal of Bone and Joint Surgery, this year.

2. *Question.*—What do you consider the best method for immunization against scarlet fever? Give the results and possible period of immunity.

   Answer.—Obtain scarlet fever toxin prophylactic (Dick) from Squibb. Give five doses in all at weekly intervals. The child may then be tested with Dick toxin for skin reactions. Interest seems to be waning in this procedure at the present time as it is impossible to predict in an individual case the end-result. Some children have been immunized apparently with success, while others have contracted the disease in spite of the injections. Apparently favorable results are obtained when large series are studied. By comparing the immunized and non-immunized children some protection seems to have been afforded the former group. In an individual case the parents may be told of these possibilities, and if they still desire the injections they can be given.

3. *Question.*—We have been having trouble with dry sterilization of our rubber gloves. What method do you use?

   Answer.—The gloves should be dried and powdered. Folding the cuff back is optional. They are then wrapped loosely in cloth and the edges held together by paper clips. Caution should be observed in not clipping the gloves to the cloth. They are then placed in an autoclave and subjected to fifteen pounds pressure for fifteen minutes. The pressure and time factor are very important as sixteen pounds pressure seems to have bad effects, etc. If the gloves are boiled, a longer time should be used.

4. *Question.*—I have a child who gets convulsions in her sleep. She is very bright, nine years old, and gets along well in school. The parents are concerned over the possibility of epilepsy as the convulsions have just started recently. How is it possible to distinguish epileptic from other convulsive seizures?

   Answer.—The differential diagnosis of convulsions is often difficult. The fact that your patient has just started to have them recently is suggestive of epilepsy. A careful history of each attack is necessary. Better still would be an opportunity to observe her in one. As a general rule, if patients hurt themselves, *i.e.,* bite their tongue, and lose sphincteric control, the condition is probably epilepsy. Be slow in making a diagnosis until you get all of the facts in the case.

5. *Question.*—At a recent staff meeting, the question of blood chemistry came up for discussion. It was brought out that many of the men write orders for blood urea nitrogen, creatinine, and uric acid on new patients. Some one suggested that blood urea nitrogen was sufficient and the other tests were not necessary unless it was elevated. It has recently come to my attention that many hospitals have substituted nonprotein nitrogen determinations for blood urea tests. Which method do you think is the best?

   Answer.—It is unnecessary on new patients to order blood urea nitrogen, creatinine, and uric acid. A single order for blood urea nitrogen is all that is needed in most cases. Many hospitals are now doing nonprotein nitrogen determinations instead of blood urea nitrogen. The values usually given are 25 to 35 mg. per 100 c.c. of blood. Amounts up to 50 mg. may not be significant in a clinical way. It appears that there is a growing tendency to use nonprotein nitrogen more and more for the determination of nitrogenous retention in renal insufficiency. All the tests indicate the same thing, normal or increased nitrogen values.

6. *Question.*—Young married woman, 18 years of age, gives history of intermittent attacks on right side that seem quite typical of ureteral colic. In some ways they are less severe than those due to stone. They have been present for more than a year and last from a day to a week. Between spells, she feels fairly well. She has never had any symptoms of bladder irritation. The patient has lost thirty-five pounds in weight in two years but now appears to be about normal. She has never been pregnant. Physical examination is negative except for moderate tenderness in the region of the right kidney. She was observed for four days in a hospital and did not show any elevation of pulse or temperature. Urine is cloudy, shows a trace of albumin, and moderate amount of pus. Flat films show no evidence of stone. Skiodan was given and an irregularity and distortion of the right pelvis was seen. Five hours later, no shadows were present. What are the diagnostic possibilities?

   Answer.—An infection of the kidney can give this picture. While these conditions are sometimes called pyelitis, pyelonephritis is usually a better term. There is a remote possibility that the lesion is tuberculous, and perhaps it would be better to rule it out. The usual cause is the colon bacillus. Treatment consists of forced fluids, alkalinization of urine, bed rest, and use of urinary antiseptics. It may be necessary to try ureteral drainage and lavage. The possibility of association with the weight loss must be kept in mind. Sometimes this results in ptosis of the kidney and defective drainage and must be corrected before improvement will take place.

BOOK REVIEWS

Books listed here become the property of the Ramsey and Hennepin County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

The Rockefeller Foundation. Annual Report, 1930. Illus. 380 pages. New York: The Rockefeller Foundation, 1931.

Infections of the Kidney. Meredith F. Campbell, M.D., F.A.C.S., Attending Urologist, Babies Hospital, New York Nursery and Child's Hospital, etc. 343 pages. Illus. Price, $3.00. New York: Harper & Brothers, 1931.

ROENTGEN INTERPRETATION; A MANUAL FOR STUDENTS AND PRACTITIONERS.

George W. Holmes and Howard E. Ruggles. 339 pp. $5.00. Philadelphia, Lea and Febiger, 1931.

The fourth edition of "Roentgen Interpretation" by Holmes and Ruggles continues to be the same useful ready reference book in roentgen diagnosis as its predecessors, brought up to date by the addition of recent advances in roentgenology. This edition now includes such newer procedures as salpingography, encephalography and intravenous urography. The portion devoted to the Graham-Cole method of gallbladder study has been revised to include recent changes. In several instances new roentgen diagnoses have been added. Though in no way radically changed, the fourth edition of this concise book is again abreast of the times in roentgen diagnosis and will continue to be useful to most any one interested in roentgen interpretation.

J. Richards Aurelius, M.D.

THE NURSES' MEDICAL LEXICON. For the Use of Graduate and Student Nurses, of Premedical and Dental Students and of the General Public. Thomas Lathrop Stedman, A.M., M.D. Price $2.00. New York: William Wood and Co., 1931.

This moderately sized volume prepared by the author of "A Practical Medical Dictionary" as the title indicates specially for the use of nurses, recommends itself because of the convenient and not too condensed size of the volume and also because of its price.

WANTED—Salaried appointments for Class A Physicians in all branches of the medical profession. Let us put you in touch with the best man for your opening. Our nation-wide connections enable us to give superior service. Aznoe's National Physicians' Exchange, 30 North Michigan Ave., Chicago. Established 1896. Member The Chicago Association of Commerce.

FOR SALE—Office equipment including X-ray. Location in Minnesota town of 1,400 people. Average income of over $5,000 yearly for the past eight years. Unopposed. Specializing. Address D-150, care Minnesota Medicine.

PRACTICAL NURSE—Graduate Clinical Laboratory and X-ray, desires work. Hospital or doctor's office. Good references. Emilie Giske, 3509 45th Ave. South, Minneapolis, Minn.

WANTED—Position in Clinic or Physician's office. Two years' experience laboratory, X-ray technician. Basal metabolism and physiotherapy. $95. Age 26. Address Florence Frey, Hillsboro, Wisconsin.

AN EXCEPTIONALLY GOOD LOCATION for a physician. Call or write C. A. Cavanaugh, druggist, 2901 Washington Ave. North, Minneapolis.

FOR SALE: Victor X-ray fluoroscope in excellent condition. Telephone, Main 4656, 601 Medical Arts Bldg., Minneapolis.

FOR SALE—Serialograph, also Universal Junior X-ray Apparatus and Tube Stand. Address D-153, care Minnesota Medicine.

MINNESOTA GRADUATE PHARMACIST wants position in dispensary or laboratory. Hospital dispensing and analyzing preferred. Ready now. Best references. Address D-154, care Minnesota Medicine.

COMPETENT LABORATORY AND X-RAY TECHNICIAN wishes work in doctor's office, clinic or hospital. Will accept small salary to prove worth. Violet H. White, Galena, Illinois.

INDEX TO VOLUME XIV

A

Abdomen, Acute, 643
Abdomen, Acute traumatic surgery of the, 150
Abdomen, Traumatic, 1047
Abortion, induced, Tetanus following (case report), 737
Abscess, Hepatic, following acute appendicitis with recovery, 155
Abscess, Intra-abdominal, 257
Accidents of labor, 892
Actinomycosis, Localized, 75
Acute abdomen, 643
Acute bowel obstruction, 16
Acute dilatation of the stomach, 218
Acute mechanical obstruction of the lower bowel, 635
Acute poliomyelitis, 396
Acute traumatic surgery of the abdomen, 150
Addison's disease, Treatment of, by the cortical hormone of Swingle and Pfiffner (case report), 442
Adhesive bandage in the treatment of varicose ulcer, The, 715
Agranulocytic angina: report of a case, 696
Alcoholic polyneuritis with cranial nerve involvement: Korsakow syndrome (case report), 259
Allergy, anaphylaxis and hypersensitiveness, 650
Allergy and pneumococcus lobar pneumonia, 898
Altnow, Hugo O., and Jensen, Herman H.: Two cases of pellagra from Minnesota, 341
Alvarez, Walter C.: Opinions of 470 physicians in regard to the advantages and disadvantages of using bran and roughage, 296
Alvarez, Walter C.: The art of medicine, 227
American Medical Association, Sketch of the early history of the, 602
American rite, The—tonsillectomy, 790
Anal fissures, The treatment of, 910
Anaphylaxis, Allergy and hypersensitiveness, 650
Anderson, Arnold: Our tuberculosis sanatoria, 437
Anderson, Ernest R., and Webb, R. C.: Hepatic abscess following acute appendicitis with recovery, 155
Anderson, James Kerr: Diagnosis and treatment of pilonidal sinus, 421
Anemia, secondary, A consideration of, 499
Anesthesia, Spinal, 531
Anesthesia, spinal, Extra-ocular muscle paralyses following, 648
Angina, Agranulocytic: report of a case, 696
Ankle joint, Fractures of the, 971
Anus and retum, Tuberculosis of the, 622
Aortic stenosis with calcareous nodules in the aortic valves, 289
Appendicitis, acute, Causes of death from, 212
Appendicitis, acute, Hepatic abscess following, with recovery, 155
Appendicitis, Retrocecal, 717
Appendicitis, Traumatic (case report), 733
Armstrong, John M.: The founding of the Ramsey County Medical Society, 904
Art of medicine, The, 227
Association of peptic ulcer and cholecystic disease, the, 330

ABSTRACTS

Eye, Ear, Nose and Throat

Brain abscess and methods of drainage, 196
Cause and treatment of some frontal headaches with report of cases, 283
Cholesteatoma, 758
Chronic maxillary sinusitis, 676
Chronic suppurative otitis media, 283
Effect of tonsillectomy in allergic conditions, The, 1010
Endogenous panopthalmitis accompanying tonsillitis, 1010
Herpes and allied conditions, 677
Important points in tonsillectomy, 196
Injuries of the ear from fracture of the skull, 1010
Intracapsular cataract extraction, 677
Management of otitis media in children, 195
Maxillary antra as foci of infection, 467
Myopia from the point of view of heredity, 466
Myopia, The control of, 937
Neuro-otological observations in concussion of the brain, 936
Occurrence of eye lesions in tuberculous patients, The, 1009
Operative treatment of glaucoma, 382
Oral infections and their relation to diseases of the eye, 109
Pathogenesis of otosclerosis, The, 1011
Physical therapy in the treatment of diseases of the ear, nose and throat, 833
Prognostic value of examination of the blood in otology, 759
Retrobulbar optic neuritis originating in the nasal sinuses, 834
Roentgen findings in suppuration of the petrous apex, 834
Sinusitis in children, 759
Study of calcium in relation to cataract—report of research, 677
Suppuration of the petrous pyramid, The, 832
Symptom of vertigo, The, 1011
Use of insulin in post-operative mastoiditis, 467

Gynecology and Obstetrics

An analysis of fifty cases of toxemia of pregnancy, 197
Concerning spasmodic conditions of the uterus and treatment, 197
Fibromyomata uteri, treatment and end-results, 198
Intrathoracic new growths, 284
The hydrogen-ion concentration of the blood in eclampsia, 197
The incidence of puerperal infection due to anaërobic streptococci, 197

Medicine

Alternating pneumothorax, 384
Cases of pulmonary tuberculosis with early cavity formation and few symptoms, 593
Development in the problem of arthritis, 469
Epithelioid cell, The, 836
Epituberculosis, 198
Leukocytic reaction in tuberculosis of infants and children, 1013
Non-apical infiltrations in pulmonary tuberculosis, 592
Relation between allergy and immunity in tuberculosis, 761
Some problems in the diagnosis and treatment of thyrotoxicosis, 198
Tuberculosis abstracts, 284, 383, 468, 590, 678, 760, 835, 938, 1011, 1080
Urinary acidity in tuberculosis, 1014
The adrenalin test and cholesterol determination in the diagnosis of borderline hyperthyroid, 199
The effect of lessened respiratory reserve on blood and circulation, 591

Pediatrics

Abdominal pain in children with upper respiratory infections, 1016
Acute hemolytic anemia in childhood, 286
Acute intussusception in infancy: operative and nonoperative treatment, 385
Acute phosphorus poisoning, 386
Alimentary anemia, 286
Antrotomy in children during tonsillectomy, 681
Appendicitis in children, 762
Blood changes in acute rheumatic affections of the heart during childhood, 838
Chorea, 110
Cod liver oil emulsified in an extract of germinating grains: Its tolerance by the infant gastro-intestinal tract and its prophylactic value, 940
Defect of the Dick test and its remedy, 109
Die tuberculinpflasterprobe—Eine vereinfachte methode zur ausführung der perkutanen tuberculinprobe, 837
Diphtheria of the umbilicus, 286
Effect of pasteurization upon the vitamin C content of milk in the presence of certain metals, The, 939
Efficiency of scarlet fever antitoxin, 680
Factors involved in combating the "hunger strike" in children, 470
Febriphobia, 1016
Feeding convalescent cases of colitis, 286
Hirschsprung's disease treated by lumbar sympathectomy, 1015
Immunity to poliomyelitis in mothers and the newborn as shown by the neutralization test, 201
Loss of immune substances from the body. II. Diphtheria antitoxin in human saliva, 940
Low fat high starch evaporated milk feeding for the marasmic baby, 470
Mechanism of the ketogenic diet in epilepsy, 762
Moro reflex as a diagnostic aid in fracture of the clavicle in the new-born infant, 762
Phenylethylhydantoin: Its use in chorea, 940
Premature infants—a study of 231 cases of premature infants at Philadelphia Lying-In Hospital, 837
Post-vaccinal encephalitis in infancy, 681
Rapidity of immunization with diphtheria toxoid, 201
Raw basic feeding in anorexia of childhood, 838
Roentgenographic re-examination of chests of children after measles, 471
Sinusitis in children, 837
Studies in scarlet fever. VI: Combined active and passive immunization to scarlet fever, 1014
Studies in scarlet fever. VII: Treatment with streptococcus antitoxic serum, 1014
Studies in the common cold, 201
Studies on the incidence of tuberculous infection, 939
Suspected juvenile tuberculosis, 110
Tetany, generalized edema and cerebral compression in the new-born, 471
The influence of feeding on certain acids in the feces of infants, 200
Therapeutic use of mixed respiratory vaccines, 385
Treatment of epidemic meningitis, 681
Tubercle bacilli in children with erythema nodosum, 681
Tuberculosis, 593
Use of powdered milk and milk derivatives in the concentration of infant foods, 110
Use of respiratory vaccine in the treatment of penumonia in children, 680
Viosterol and cod liver oil, 1015

Roentgenology

Diagnosis and treatment of the so-called sciatic neuralgias, 763
Elaboration of criteria upon which the early diagnosis of acute intestinal obstruction may be made. With special consideration of the value of X-ray evidence, 1017
Irritable colon, The, 111
Obstructive lesions of the small bowel, 1017
Osseous changes in hyperparathyroidism associated with parathyroid tumor, 1018
Pathology of early pulmonary tuberculosis as revealed by X-rays, 111
Roentgen diagnosis of aortic aneurism, 1018
Roentgenological appearance of interlobar and mediastinal encapsulated effusion in the thorax, 838

Surgery

Acute pancreatitis, abdomino-lumbar transfixion in the drainage of acute pancreatitis, 200
Anuria—report of nine cases, 684
Coccidiodal granuloma—roentgen diagnosis, 763
Immediate and remote end-results following operations on the biliary passages, 682
Mixed tumors of the kidney in infancy and childhood, 287
Mixed tumors of the salivary glands, 386
Operative treatment of syringomyelia, 685
Push fluids, 386
Spinal anesthesia by limited individually dosed belt-like distribution, 839
Spondylolithesis, 387
The conservative treatment of prepatellar bursitis, 594
Therapeutic pulmonary collapse by alcoholism of phrenic nerve, 472
The surgery of diabetes as it concerns gangrene of the lower extremities and carbuncles, 199
The treatment of harelip and other facial clefts, 199
Treatment of epicondylitis humeri, 472
Treatment of various peripheral pain syndromes by subarachnoid alcoholization of posterior nerve roots, at their emergence from the spinal cord, 1018
Über die Resultate der Operativen Behandlung der Grawitztumoren, 287

B

Backache from the orthopedic viewpoint, 249
Bacteriology of acute rheumatic fever with an experimental basis in animals for vaccine therapy, 1
Balfour, Donald C.: Recent developments in the treatment of duodenal ulcer, 953
Basal metabolic rates, low, Concerning limitations of the clinical significance of, 713
Bayard, Harry F.: Rectal myoma (case report), 1061
Bayard, Harry F.: The treatment of anal fissures, 910
Bellows, H. A.: Radio and quack medical propaganda, 597
Benign polyps of the colon and their relation to cancer, 416
Benjamin, Arthur E.: Diverticulitis of the colon and sigmoid—Its complications and treatment, 912
Bergheim, Martin C.: Prenatal care and the careful conduct of delivery, 884
Bilateral spontaneous pneumothorax (case report), 80
Bilateral spontaneous pneumothorax: Report of a case (case report), 550
Blind, deaf and feebleminded, The, 435
Blood pressure, Racial differences in, 726
Bowel, Functional disorders of the, 411
Bowel, lower, Acute mechanical obstruction of the, 635
Bowel obstruction, Acute, 16
Bowing, Harry H., and Fricke, Robert E.: Irradiation of carcinoma of the cervix uteri, 237
Boynton, Ruth E.: Vaginal thrush (case report), 1058
Braasch, William F.: Intravenous urography, 978
Brain, Diffuse subcortical sclerosis of the, 62
Brain tumor, The relationship of epileptic seizures to, 245

Bran and roughage, Opinions of 470 physicians in regard to the advantages and disadvantages of using, 296
Bray, E. R.: Treatment of paranasal sinusitis, 1051
Bumpus, L. Dudley, and Snell, Albert M.: Unusual deficiency syndrome secondary to duodenal occlusion and ulcerative colitis, 336
Burns, Electric, and shock, 701
Burns, H. A.: The institutional care of tuberculosis, 618
Burns, H. A.: Tuberculosis, a public health problem, 431
Burns, William J.: The place of the local medical society, 113
Busher, Herbert: Retrocecal appendicitis, 717
Buzzelle, L. K., and Green, E. K.: Vaginal hernia, 163

Book Reviews

Alvarez, Walter C.: Nervous indigestion, 288
Annual reprint of the reports of the Council on Pharmacy and Chemistry of the American Medical Association, 764
Bassler, Anthony: Intestinal toxemia (autointoxication) biologically considered, 1020
Bluemel, C. S.: Mental aspects of stammering, 596
Braithwaite, J. V. C.: Infant Feeding, 474
Clendening, Logan: Modern Methods of Treatment, 473
Composite Index and Cumulative Supplement, 474
Fifield, James Clark: American physicians and surgeons, 941
General Medicine, The Practical Medicine Series, 388
Gossett: What the public should know about childbirth, 1020
Harras, J. A., et al: The Measurement of Man, 474
Haultain, W. F. T., and Fahmy, E. Chalmers: Ante-Natal Care, 473
Helmholz, Henry F., and Amberg, Samuel: Diseases of the genito-urinary system in infancy and childhood, 387
Holmes, George W., and Ruggles, Howard E.: Roentgen interpretation: a manual for students and practitioners, 1082
Homans, John: A textbook of surgery, 686
Kohn, L. Winfield: Practical Treatise on Diseases of the Digestive System, 475
Laroche, Richet, and Saint-Girons: Alimentary anaphylaxis, translated by Mildred P. and Albert H. Rowe, 112
Lyttle, John D.: Laboratory Pediatrics, 473
May, Charles M.: Manual diseases of the eye, 202
Meyer, Willy: Cancer: Its Origin, Its Development and Its Self-Perpetuation, 476
Miller, C. Jeff: An introduction to gynecology, 942
Murray, Clay Ray: Treatment of injury by the general practitioner, 941
New and non-official remedies, 1931, 840
Osler and McCrae: Modern Medicine, 473
Pruitt, Marion C.: Modern practology, 941
Rachemann, Francis M.: Clinical allergy, particularly asthma and hay fever: Mechanism and treatment, 595
Roddis, Louis H.: Edward Jenner and the discovery of smallpox vaccination, 112
Schilling, V.: The blood picture and its clinical significance, translated by R. B. H. Gradwohl, 202
Simkins, Cleveland Sylvester: Textbook of human embryology, 764
Stedman, Thomas Lathrop: A Practical Medical Dictionary. 474
Stedman, Thomas Lathrop: The nurses' medical lexicon, 1082
Stieglitz, E. J.: Arterial hypertension, 388
Stimson, Philip M.: Common contagious diseases, 840
Williams, J. W.: Obstetrics, 202
Wohl, Michael G.: Bedside interpretation of laboratory findings, 942
Young, James K: Handbook of anatomy, being a complete compend of anatomy, 595

C

Camp, Walter E.: The pathology and pathogenesis of occular melanomata, 784
Carcinoma of colon and sigmoid, 627
Carcinoma of the cervix uteri, Irradiation of, 237
Carcinoma of the larynx, Double bronchial cysts complicated by (case report), 555
Carcinoma of the pancreas with esophageal obstruction from metastasis to the lymph nodes of the mediastinum (case report), 352
Carcinoma of the uterus, The present status of the treatment of, 943
Cardiac emergencies, 517
Cardiology and the general practitioner, 879
Carditis, Rheumatic, 8
Causes of death from acute appendicitis, 212
Cerebrospinal meningitis, 54
Cervicitis, chronic, Office treatment of, 507
Cervix uteri, Irradiation of carcinoma of the, 237
Chatterton, Carl C.: Gillette State Hospital for crippled and deformed children, 439
Chest diseases, Some points in the differential diagnosis of, 301
Chest, The value of the roentgenologic examination of the, 984
Children, crippled and deformed, Gillette State Hospital for, 439
Cholecystic disease and peptic ulcer, Factors of importance in the differential diagnosis of, 706
Cholecystic disease and peptic ulcer, The association of, 330
Clawson, B. J.: Bacteriology of acute rheumatic fever with an experimental basis in animals for vaccine therapy, 1
Cole, Wallace H.: Free joint bodies (case report), 354
Colitis, ulcerative, and duodenal occlusion, Unusual deficiency syndrome secondary to, 336
Colon and sigmoid, Carcinoma of, 627
Colon and sigmoid, Diverticulitis of the—Its complications and treatment, 912
Colon, Benign polyps of the, and their relation to cancer, 416
Colon, The indications for an examination of the, 992
Colvin, A. R.: Fractures of the hip, 960
Committee on Public Health Education, 90, 180, 268, 362, 448, 562, 662, 744, 824, 930, 1002, 1066
Compression fractures of the vertebræ, 720
Concerning limitations of the clinical significance of low basal metabolic rates, 713
Condit, William H.: Non-specific vaginitis, 319
Congenital hypertrophic pyloric stenosis, 540
Congenital intestinal obstruction (case report), 736
Consideration of secondary anemia, A, 499
Consultation Bureau, 92, 182, 270, 364, 451, 566, 666, 748, 826, 933, 1006, 1079
Coronary occlusion, 206
Cosas medicas Filipinas (Philippine medical affairs), 346
Cottam, Geoffrey: The supracricoid administration of lipiodol, 1070
Counseller, Virgil S.: Leukoplakic vulvitis or kraurosis vulvæ: its relation to carcinoma and its surgical treatment, 312
Coventry, W. A., and Moe, Russell J.: Trichomonas vaginalis vaginitis, 1024
Craig, Winchell McK.: Head injuries, 131
Crippled and deformed children, Gillette State Hospital for, 439
Crownhart, J. G.: The economic trend in medicine, 118
Cysts, Double bronchial, complicated by carcinoma of the larynx (case report), 555
Cyst, Omental, in a child (case report), 656

COMMUNICATIONS

Goodwin, E. J., 447
Young, J. R., 934

D

Davis, Ben F.: Wounds of the thorax, 127
Davis, Edwin: Results in perineal prostatectomy, 389
Davis treatment of compression fractures of the spine with a suggested method in dislocations, The, 135
Deaf, blind and feeble minded, The, 435
Deficiency syndrome, Unusual, secondary to duodenal occlusion and ulcerative colitis, 336
Delivery, the careful conduct of, and, Prenatal care, 884
Detection and treatment of respiratory infections among University students, 425
Diabetes, bronzed, or hemochromatosis (case report), 260
Diabetes mellitus, Hyperthyroidism complicating (case report), 546
Diagnosis and treatment of pilonidal sinus, 421
Diagnosis of herpes zoster ophthalmicus, 322
Diehl, Harold S.: Racial differences in blood pressure, 726
Differential diagnosis of endocarditis, 521
Diffuse subcortical sclerosis of the brain, 62
Diphtheria and scarlet fever, Immunology of, 47
Diverticulitis of the colon and sigmoid—It's complications and treatment, 912
Diverticulum, Meckel's, Fibrosarcoma of a, producing intestinal hemorrhage, 233
Dixon, Claude F., and Smith, Frederick L.: The adhesive bandage in the treatment of varicose ulcer, 715
Doctor takes a hand in veterans' relief, The, 765
Double branchial cysts complicated by carcinoma of the larynx (case report), 555
Duodenal occlusion and ulcerative colitis, Unusual deficiency syndrome secondary to, 336
Duodenal ulcer, Recent developments in the treatment of, 953

E

Ear, middle, chronic suppuration of the, A new and effective non-surgical method for the treatment of, 1054
Eckman, P. F., and Tuohy, E. L.: Aortic stenosis with calcareous nodules in the aortic valves, 289
Economic importance of squint in children and its effect in after years, The, 324
Economic trend in medicine, The, 118
Economic trend in medicine, The: What is it? 121
Edwards, Ralph T.: Cosas medicas Filipinas (Philippine medical affairs), 346
Electric burns and shock, 701
Emphysema, Subcutaneous, following aspiration of foreign body (case report), 654
Empyema, acute, The surgical treatment of, 1042
Endocarditis, acute rheumatic, Organized care of patients with, 428
Endocarditis, Differential diagnosis of, 521
Endocarditis, Subacute bacterial, involving the tricuspid valve only (case report), 82
Endometriosis, 504
Enteritis, Phlegmonous, 956
Epileptic colony, 438
Epileptic seizures, The relationship of, to brain tumor, 245
Esophagus, Foreign body (needle) in the (case report), 443
Esophagus, Pulsion diverticulum of the (case report), 1059
Evans, Edward T.: Acute poliomyelitis, 396
Evans, Edward T.: The Davis treatment of compression fractures of the spine with a suggested method in dislocations, 135
Evans, Edward T., and Henry, Myron O.: Permanent disabilities of the extremities. A proposed rating schedule, 171
Exley, E. W., and Thomas, Gilbert J.: Some of the present methods used in the diagnosis and treatment of prostatic hypertrophy, 729
Experiences in county medical organization, 605
Extra-ocular muscle paralysis following spinal anesthesia, 648
Extremities, Permanent disabilities of the. A proposed rating schedule, 171

EDITORIAL

A Mother India of medicine, 445
Coronary thrombosis, 928
"Doc" Williams, 660
Doctors' bills, 85
Dr. Birnberg's movie films of Russia and his comments, 358
Dr. William A. Jones, 178
Druggist and the doctor, The, 741
Early detection of tuberculosis, The, 659
Hibbing and the Northern Minnesota Medical Meeting, 929
History Committee, 87, 179, 267
Increasing clientele, 928
Mitral insufficiency, 822
More humanism in medical societies, 1000
Northwest Regional Medical Conference, 446
Our error, 1000
Our policy, 446
Our state meeting, 445
Poliomyelitis in Minnesota, 927
Poliomyelitis situation, The, 999
Pneumococcic serum, 87
Psychopathic Hospital, The, 265
Recent questionnaire, The, 178
Shoulders resolution, The, 821
State Association, The—What it has done and is doing, 1064
State medicine for 4,000,000 veterans, 1063
State meeting, The, 357
Strange case of diabetes, The, 560
Streptococcus vaccination in chronic arthritis, 559
Tetanus prevention, 742
Tobacco, 359
Tuberculosis campaign, The, 358
University Hospital staff reports, 561
University support, 177
Use of toxoid for immunization against diphtheria, The, 86
Work and happiness, 266

F

Factors of importance in the differential diagnosis of cholecystic disease and peptic ulcer, 706
Fansler, Walter A., and Petter, Charles K.: Tuberculosis of the anus and rectum, 622
Faust, Louis S., and Walters, Waltman: Fibrosarcoma of a Meckel's diverticulum producing intestinal hemorrhage, 233
Fawcett, K. R.: Extra-ocular muscle paralysis following spinal anesthesia, 648
Feeble minded, blind and deaf, The, 435
Fever, Undulent, 691
Fibrosarcoma of a Meckel's diverticulum producing intestinal hemorrhage, 233
Figi, Frederick A., and New, Gordon B.: Treatment of secondary deformity in cases of harelip, 514
Fink, Walter H.: Diagnosis of herpes zoster ophthalmicus, 322
Fissures, anal, The treatment of, 910

Foreign body (needle) in the esophagus (case report), 443
Fortney, Arthur C.: Undulant fever, 691
Founding of the Ramsey County Medical Society, The, 904
Fractures, compression, of the spine, The Davis treatment of, with a suggested method in dislocations, 135
Fractures, Compression, of the vertebræ, 720
Fractures of the ankle joint, 971
Fractures of the hip, 960
Fracture of the humerus, 963
Fractures of the pelvis, 29
Free joint bodies (case report), 354
Fricke, Robert E., and Bowing, Harry H.: Irradiation of carcinoma of the cervix uteri, 237
Functional disorders of the bowel, 411

G

Gallbladder and stomach, The value of roentgenologic examination of the, 987
Gangrene, gas, and tetanus, Treatment of, 142
Gardner, Edwin L.: The indications for an examination of the colon, 992
Gardner, Edwin L.: The protean pathological manifestations of rheumatic fever, 12
General physical examination, 974
Ghormley, Ralph K.: Backache from the orthopedic viewpoint, 249
Gillette State Hospital for crippled and deformed children, 439
Goiter, toxic, The importance of the, complicating or complicated by other conditions requiring surgical interference, 254
Green, E. K., and Buzzelle, L. K.: Vaginal hernia, 163

H

Hanson, E., and Myers, J. Arthur: Detection and treatment of respiratory infections among University students, 425
Harelip, Treatment of secondary deformity in cases of, 514
Harrington, F. E.: The physician's coöperation in public health administration, 168
Harrington, Stuart W.: The surgical treatment of acute empyema, 1042
Hartley, E. C.: A point of view in medicine, 611
Head injuries, 131
Head injuries, The neurological aspect of, 509
Health administration, public, The physician's coöperation in, 168
Health education, 124
Health examinations, periodic, in young adults, An unexploited therapeutic opportunity in, 526
Heart disease, Prognosis in, 405
Heimark, J. J., and Miller, H. A.: Hemochromatosis or bronzed diabetes (case report), 260
Heliotherapy, both artificial and natural, A summary of the indications, technic and results to be expected in the use of, 793
Helmholz, Henry F.: Rheumatic fever in childhood, 5
Hemocromatosis or bronzed diabetes (case report), 260
Hengstler, William H.: The neurological aspect of head injuries, 509
Hengstler, W. H.: The problem of the functional nervous case, 308
Henry, Myron O., and Evans, Edward T.: Permanent disabilities of the extremities. A proposed rating schedule, 171
Hensel, Charles N.: Non-myxedematous hypothyroidism, 221
Hepatic abscess following acute appendicitis with recovery, 155
Herman, Arthur L.: Double branchial cysts complicated by carcinoma of the larynx (case report), 555
Hernia, Vaginal, 163
Herpes zoster ophthalmicus, Diagnosis of, 322
Hip, Fractures of the, 960
Historic review of American and English literature on vital capacity, 1031
History, early, of the American Medical Association, Sketch of the, 602
Hoffman, Max H.: Rheumatic carditis, 8
Holbrook, J. S.: Fractures of the ankle joint, 971
Hospital for the insane, 440
Hullsiek, Harold E.: Benign polyps of the colon and their relation to cancer, 416
Hullsiek, Harold E.: Impalement of the rectum (case report), 353
Humerus, Fracture of the, 963
Humphrey, E. W.: Large benign mole of the scalp (case report), 262
Hymes, Charles: A new and effective non-surgical method for the treatment of chronic suppuration of the middle ear, 1054
Hypersensitiveness, Allergy, anaphylaxis and, 650
Hypertension, An unusual case of (case report), 175
Hyperthyroidism complicating diabetes mellitus (case report), 546
Hypothyroidism, Non-myxedematous, 221

I

Immunization, wholesale passive, A proposal of, against poliomyelitis epidemics, 921
Immunology of diphtheria and scarlet fever, 47
Impairment of vision following head injury, 809
Impalement of the rectum (case report), 353
Impetigo or pemphigus neonatorum, with special reference to etiology and prophylaxis, 399
Importance of the toxic goiter complicating or complicated by other conditions requiring surgical interference, The, 254
Indications for an examination of the colon, The, 992
Indications for spinal puncture, 996
Insane, Hospital for the, 440
Institutional care of tuberculosis, The, 618
Institutions, Our state, 435
Intestinal obstruction, Congenital (case report), 736
Intra-abdominal abscess, 257
Intravenous urography, 978
Irradiation of carcinoma of the cervix uteri, 237

J

Jensen, Herman H., and Altnow, Hugo O.: Two cases of pellagra from Minnesota, 341
Johnson, James A.: Acute mechanical obstruction of the lower bowel, 635
Johnson, Norman: An unexploited therapeutic opportunity in periodic health examinations of young adults, 526
Joint bodies, Free (case report), 354
Jones, E. Mendelssohn, Phlegmonous enteritis, 956
Judd, E. Starr: Sketch of the early history of the American Medical Association, 602

K

Kamman, Gordon R.: Alcoholic polyneuritis with cranial nerve involvement: Korsakow syndrome (case report), 259
Kernkamp, Leila M., and Myers, J. A.: Some points in the differential diagnosis of chest diseases, 301
Kilbourne, Arthur F.: Hospital for the insane, 440
Kinsella, Ralph A.: Present theories concerning the etiology of acute rheumatic fever, 203
Kintner, Arthur A., and Lymburner, Ross M.: Treatment of Addison's Disease by the cortical hormone of Swingle and Pfiffner (case report), 442

Kliman, Frank E.: Endometriosis, 504
Knapp, Frank N.: The economic importance of squint in children and its effect in after years, 324
Knight, Ralph T.: Acute abdomen, 643
Koenigsberger, Charles: An unusual case of hypertension (case report), 175
Kohlbry, Carl O.: Cerebrospinal meningitis, 54
Korsakow syndrome: Alcoholic polyneuritis with cranial nerve involvement (case report), 259
Kraurosis vulvæ, or leukoplakic vulvitis: its relation to carcinoma and its surgical treatment, 312

L

Labor, Accidents of, 892
Laird, Arthur T.: Some clinical features of chronic pulmonary fibrosis, 209
Lajoie, John M.: Cardiac emergencies, 517
Lamont, John G.: Bilateral spontaneous pneumothorax (case report), 80
Large benign mole of the scalp (case report), 262
Larynx, carcinoma of the, Double branchial cysts complicated by (case report), 555
Lemon, Willis S.: Historic review of American and English literature on vital capacity, 1031
Leukoplakic vulvitis or kraurosis vulvæ: its relation to carcinoma and its surgical treatment, 312
Lewis, W. W.: The American rite-tonsillectomy, 790
Library, The Ramsey County Medical Society's, 906
Licentiates, December 1930, 477
Licentiates, March 1931, 478
Lipiodol, The supracricoid administration of, 1070
Localized actinomycosis, 75
Logefeil, Rudolph C.: Agranulocytic angina: report of a case, 696
Long, W. H.: A consideration of secondary anemia, 499
Luten, Drew: Cardiology and the general practitioner, 879
Lymburner, Ross M., and Kintner, Arthur R.: Treatment of Addison's Disease by the cortical hormone of Swingle and Pfiffner (case report), 442

Mc

McBroom, D. E.: Epileptic colony, 438
McDonald, Archibald L.: Causes of death from acute appendicitis, 212
McGandy, Robert F.: Electric burns and shock, 701
McKinlay, C. A.: Concerning limitations of the clinical significance of low basal metabolic rates, 713
McKinley, J. Charnley: A proposal of wholesale passive immunization against poliomyelitis epidemics, 921
McKinley, J. Charnley: Diffuse subcortical sclerosis of the brain, 62

M

Magney, F. H.: Health education, 124
Malaria and Paresis, 779
Manley, James R.: Accidents of labor, 892
Manson, M. H.: Treatment of tetanus and gas gangrene, 142
Mariette, Ernest S.: A summary of the indications, technic and results to be expected in the use of both artificial and natural heliotherapy, 793
Marshall, James M., and Vinson, Porter P.: Carcinoma of the pancreas with esophageal obstruction from metastasis to the lymph nodes of the mediastinum (case report), 352
Mason, James B., and Rivers, Andrew B.: The association peptic ulcer and cholecystic disease, 330
Mason, James B., and Rivers, Andrew B.: Factors of importance in the differential diagnosis of cholecystic disease and peptic ulcer, 706
Mattson, C. H., and Starkey, T. A.: Tetanus following induced abortion (case report), 737
Mayo, Charles, 2nd: The importance of the toxic goiter complicating or complicated by other conditions requiring surgical interference, 254
Mayo, William J.: Medical pioneers of Minnesota, 224
Measles and poliomyelitis, Serotherapy of, 42
Meckel's diverticlum, Fibrosarcoma of a, producing intestinal hemorrhage, 233
Medical pioneers of Minnesota, 224
Medical society, local, The place of the, 113
Medicine, A point of view in, 611
Medicine, The art of, 227
Medicine, The economic trend in, 118
Medicine, The economic trend in: What is it? 121
Melanomata, ocular, The pathology and pathogenesis of, 784
Meningitis, Cerebrospinal, 54
Meyer, Karl: Acute traumatic surgery of the abdomen, 150
Meyerding, Henry W.: Fracture of the humerus, 963
Miller, H. A., and Heimark, J. J.: Hemocromatosis or bronzed diabetes (case report), 260
Mitral disease in adults, 1021
Moe, Russell J., and Coventry, W. A.: Trichomonas vaginalis vaginitis, 1024
Moersch, Herman J., and Vinson, Porter P.: Subcutaneous emphysema following aspiration of foreign body (case report), 654
Mole, Large benign, of the scalp (case report), 262
Morrow, James: Acute dilatation of the stomach, 218
Murdoch, J. M.: The feeble minded, blind and deaf, 435
Murray, Robert A.: Impetigo or pemphigus neonatorum, with special reference to eitology and prophylaxis, 399
Mussey, Robert D.: Recurring pre-eclamptic toxemia: its clinical significance, 889
Myers, J. Arthur, and Hanson, E.: Detection and treatment of respiratory infections among University students, 425
Myers, J. A., and Kernkamp, Leila M.: Some points in the differential diagnosis of chest diseases, 301
Myoma, Rectal (case report), 1061

MISCELLANEOUS

Adding insult to injury—brazen effrontery of the American Tobacco Company, 565
Committee on Public Health Education, 90, 180, 268, 362, 448, 562, 662, 744, 824, 930, 1002, 1066
Consultation Bureau, 92, 182, 364, 451, 566, 666, 748, 826, 933, 1006, 1079
Licentiates, December, 1930, 477, March, 1931, 478, May and June, 841
Minnesota State Board of Medical Examiners, 89, 184, 269, 365, 663, 823, 931
President's Letter, 91, 176, 264, 356, 444, 558, 658, 740, 820, 926, 998, 1062
Satisfactory method of obtaining prostatic and seminal vesicular secretions for bacterial staining, 184
Training for Medical Reserve Officers at the Mayo Foundation, Rochester, Minnesota, and Washington University School of Medicine, St. Louis, Missouri, 564

N

Nagel, H. D.: Pulsion diverticulum of esophagus (case report), 1059
Nervous case, functional, The problem of the, 308
Neurological aspect of head injuries, The, 509
New and effective non-surgical method for the treatment of chronic suppuration of the middle ear, A, 1054

New, Gordon B., and Figi, Frederick A.: Treatment of secondary deformity in cases of harelip, 514
Non-articular forms of rheumatic fever, The, 14
Non-myxedematous hypothyroidism, 221
Non-specific vaginitis, 319

O

Observations on serotherapy in scarlet fever, 537
Obstruction, Acute mechanical, of the lower bowel, 635
Ocular melanomata, The pathology and pathogenesis of, 784
Oerting, Harry: Subacute bacterial endocarditis involving the tricuspid valve only (case report), 82
Oerting, Harry: The non-articular forms of rheumatic fever, 14
Office treatment of chronic cervicitis, 507
Offutt, Susan R.: Office treatment of chronic cervicitis, 507
Omental cyst in a child (case report), 656
Opinions of 470 physicians in regard to the advantages and disadvantages of using bran and roughage, 296
Organization, county medical, Experiences in, 605
Organized care of patients with acute rheumatic endocarditis, 428
Our state institutions, 435
Our tuberculosis sanatoria, 437

OBITUARY

Anderson, Andrew E., 89
Barrett, Frederick, 1069
Bigelow, Charles Sumner, 561
Bohling, Bernard Stanton, 269
Bratrud, Theodor, 183
Brooks, Dwight F., 89
Brown, Silas E., 1001
Case, Elias P., 363
Dodge, William, 269
Dunsmoor, Frederick A., 88
Fritsche, L. A., 743
Hallowell, W. H., 89
Jones, William A., 183
Klein, W. L., 932
Kumpf, Albert, 1001
McKinnon, Joseph J., 827
Mitchell, Frederick J., 1069
Murray, Daniel D., 1069
Neseth, O. S., 561
O'Brien, Henry J., 932
O'Hara, J. J., 743
Palmer, Reuben Nathaniel, 1069
Parrott, Byron W., 447
Rees, Soren P., 1001
Robilliard, Walter Henry, 1069
Swartwood, Fred A., 184
Williams, Henry L., 661

P

Pachymeningitis hemorrhagica interna (case report), 547
Pancreas, Carcinoma of the, with esophageal obstruction from metastasis to the lymph nodes of the mediastinum (case report), 352
Paralysis, muscle, extra-ocular, following spinal anesthesia, 648
Parker, Harry L.: The relationship of epileptic seizures to brain tumor, 245
Parker, Owen W.: Fractures of the pelvis, 29
Paresis and malaria, 779
Pathology and pathogenesis of ocular melanomata, The, 784
Pearce, N. O.: The saturation point, 768
Pellagra, Two cases of, from Minnesota, 341
Pelvis, Fractures of the, 29
Pemphigus neonatorum, or Impetigo, with special reference to etiology and prophylaxis, 399
Peptic ulcer and cholecystic disease, Factors of importance in the differential diagnosis of, 706
Peptic ulcer and cholecystic disease, The association of, 330
Permanent disabilities of the extremities. A proposed rating schedule, 171
Peter, Charles K., and Fansler, Walter A.: Tuberculosis of the anus and rectum, 622
Philippine medical affairs, 346
Phlegmonous enteritis, 956
Physician's coöperation in public health administration, The, 168
Physical examination, General, 974
Pioneers, Medical, of Minnesota, 224
Place of the local medical society, The, 113
Platou, Erling S., and Stewart, Chester A.: Serotherapy of measles and poliomyelitis, 42
Pneumococcus lobar pneumonia, and Allergy, 898
Pneumothorax, Bilateral spontaneous (case report), 80
Pneumothorax, Bilateral spontaneous: Report of a case (case report), 550
Point of view in Medicine, A, 611
Poliomyelitis, Acute, 396
Poliomyelitis and measles, serotherapy of, 42
Poliomyelitis epidemics, A proposal of wholesale passive immunization against, 921
Polyneuritis, Alcoholic, with cranial nerve involvement: Korsakow syndrome (case report), 259
Polyps, Benign, of the colon and their relation to cancer, 416
Prenatal care and the careful conduct of delivery, 884
Present day problems, 687
Present status of the treatment of carcinoma of the uterus, The, 943
Present theories concerning the etiology of acute rheumatic fever, 203
President's Letter, 91, 176, 264, 356, 444, 558, 658, 740, 820, 926, 998, 1062
Problem of the functional nervous case, The, 308
Problems, Present day, 687
Prognosis in heart disease, 405
Proposal of wholesale passive immunization against poliomyelitis epidemics, A, 921
Prostatectomy, perineal, Results in, 389
Prostate in a general examination, The, 216
Prostatic hypertrophy, Some of the present methods used in the diagnosis and treatment of, 729.
Protean pathological manifestations of rheumatic fever, The, 12
Pulmonary fibrosis, chronic, Some clinical features of, 209
Pulsion diverticulum of the esophagus (case report), 1059

Q

Quack medical propaganda, Radio and, 597

R

Racial differences in blood pressure, 726
Radio and quack medical propaganda, 597
Raiter, Roy F.: Traumatic abdomen, 1047
Ramsey County Medical Society, The founding of the, 904
Ramsey County Medical Society's Library, The, 906
Rathe, Herbert W.: Coronary occlusion, 206
Recent developments in the treatment of duodenal ulcer, 953
Rectal myoma (case report), 1061
Rectum and anus, Tuberculosis of the, 622

Rectum, Impalement of the (case report), 353
Recurring pre-eclamptic toxemia: its clinical significance, 889
Reimann, H. A.: Allergy and pneumococcus lobar pneumonia, 898
Relationship of epileptic seizures to brain tumor, The, 245
Respiratory infections, Detection and treatment of, among University students, 425
Results in perineal prostatectomy, 389
Retrocecal appendicitis, 717
Rheumatic carditis, 8
Rheumatic endocarditis, acute, Organized care of patients with, 428
Rheumatic fever, acute, Bacteriology of, with an experimental basis in animals for vaccine therapy, 1
Rheumatic fever, acute, Present theories concerning the etiology of, 203
Rheumatic fever in childhood, 5
Rheumatic fever, The non-articular forms of, 14
Rheumatic fever, The protean pathological manifestations of, 12
Rivers, Andrew B., and Mason, James B.: The association of peptic ulcer and cholecystic disease, 330
Rivers, Andrew B., and Mason, James B.: Factors of importance in the differential diagnosis of cholecystic disease and peptic ulcer, 706
Rizer, Robert I.: Vincent's disease, 901
Roentgenologic examination of the chest, The value of the, 984
Roentgenologic examination of the stomach and gallbladder, The value of, 987
Rosenthal, Robert: Pachymeningitis hemorrhagica interna (case report), 547
Ruhberg, George N.: Paresis and malaria, 779
Rumpf, William H., Jr.: Treatment of salpingitis, 1028

S

Salpingitis, Treatment of, 1028
Sarcoma of the throat (case report), 552
Saturation point, The, 768
Scalp, Large benign mole of the (case report), 262
Scarlet fever and diphtheria, Immunology of, 47
Scarlet fever, Observations on serotherapy in, 537
Schuldt, F. C.: Carcinoma of colon and sigmoid, 627
Sclerosis, Diffuse subcortical, of the brain, 62
Serotherapy of measles and poliomyelitis, 42
Shannon, W. Ray: Immunology of diphtheria and scarlet fever, 47
Shapiro, M. J.: Organized care of patients with acute rheumatic endocarditis, 428
Shock, Electric burns and, 701
Sigmoid and colon, Carcinoma of, 627
Sigmoid and colon, Diverticulitis of the—Its complications and treatment, 912
Sinus, pilonidal, Diagnosis and treatment of, 421
Sinusitis, paranasal, Treatment of, 1051
Sketch of the early history of the American Medical Association, 602
Smith, Arthur E.: Impairment of vision following head injury, 809
Smith, Frederick L., and Dixon, Claude F.: The adhesive bandage in the treatment of varicose ulcer, 715
Smith, Harry L.: Differential diagnosis of endocarditis, 521
Snell, Albert M., and Bumpus L. Dudley: Unusual deficiency syndrome secondary to duodenal occlusion and ulcerative colitis, 336
Sohmer, A. E.: The prostate in a general examination, 216
Sogge, L.: Present day problems, 687
Sogge, L., President Minnesota State Medical Association, 1931, Photograph, 84
Some of the present methods used in the diagnosis and treatment of prostatic hypertrophy, 729
Some clinical features of chronic pulmonary fibrosis, 209
Some points in the differential diagnosis of chest diseases, 301
Spinal anesthesia, 531
Spinal puncture, Indications for, 996
Spine, The Davis treatment of compression fractures of the, with a suggested method in dislocations, 135
Squint, The economic importance of, in children, and its effect in after years, 324
Stangl, Fred H.: Congenital intestinal obstruction (case report), 736
Stangl, P. E.: Intra-abdominal abscess, 257
Starkey, T. A., and Mattson, C. H.: Tetanus following induced abortion (case report), 737
Stenosis, Aortic, with calcareous nodules in the aortic valves, 289
Stenosis, Congenital hypertrophic pyloric, 540
Stewart, Alex: Observations on serotherapy in scarlet fever, 537
Stewart, Chester A., and Platou, Erling S.: Serotherapy of measles and poliomyelitis, 42
Stoesser, Albert V.: Allergy, anaphylaxis and hypersensitiveness, 650
Stomach, Acute dilatation of the, 218
Stomach and gallbladder, The value of roentgenologic examination of the, 987
Subacute bacterial endocarditis involving the tricuspid valve only (case report), 82
Subcutaneous emphysema following aspiration of foreign body (case report), 654
Surgery, Acute traumatic, of the abdomen, 150
Summary of the indications, technic and results to be expected in the use of both artificial and natural heliotherapy, A, 793
Suppuration, chronic, of the middle ear, A new and effective non-surgical method for the treatment of, 1054
Supracricoid administration of lipiodol, The, 1070
Surgical treatment of acute empyema, The, 1042

Societies

A. M. A. Exhibits, 93
American Association for the Study of Goiter, 271
American College of Physicians, 667, 1071
American Congress of Physical Therapy, 830
American Proctologic Society, 567
Association of Resident and Ex-Resident Physicians of the Mayo Clinic, 1007
Camp Release District Society, 94, 186
Chisago-Pine and Central Minnesota District Societies, Joint meeting, 935
Clay-Becker County Society, 186
Dodge County Society, 935
Interstate Post Graduate Medical Association of North America, 568, 830
Iowa State Medical Society, 1071
Lyon-Lincoln County Medical Society, 1007
Medical broadcast for the month, 93, 186, 271, 366, 452, 567, 667, 745, 828, 934, 1007, 1071
Minneapolis Clinical Club, 104, 278, 379, 462, 754
Minneapolis Surgical Society, 102, 191, 274, 379, 458, 574, 670, 1076
Minneapolis Academy of Medicine, 95, 188, 273, 372, 455, 570, 751, 1073
Minnesota Medical Alumni Association, 830, 934
Minnesota Radiological Society, 271, 568, 1071
Minnesota Society of Internal Medicine, 367, 1007, 1072
Minnesota State Medical Association, 1931 meeting, 93, 365, 452, 567
  Proceedings of Seventy-eighth Annual Session, 843
  Roster, 479

Mississippi Valley Conference on Tuberculosis, 1072
Mississippi Valley Conference on Tuberculosis and Sanatorium Association, 828
National Society for Prevention of Blindness, 1071
Nicollet-Le Sueur County Society, 94
North Central Branch of the American Urological Association, 935
Northern Minnesota Medical Association, 452, 745, 828,
Northwestern Pediatric Society, 1008
Northwest Pediatric Society and Staff of Children's Hospital—Joint Meeting, 667
Olmsted County Society, 94
Pan-American Medical Association, 367, 567
Park Region Medical Society, 1008
Ramsey County Medical Society, 93
Range Medical Society, 94
Red River Valley Society, 93, 568, 934, 1008
Redwood-Brown County Society, 667
Regional Conference, 370
Rice County Society, 94, 271, 452, 1007
Saint Louis County Medical Society, 1007
Scott-Carver County Society, 93, 452, 830
Secretaries' Conference, 186
Southern Minnesota Medical Association, 668, 745, 935
Southwestern Minnesota Medical Society, 668, 1007, 1072
Stearns-Benton County Society, 567, 1007
Steele County Society, 1072
Upper Mississippi Medical Society, 568, 746
Wabasha County Society, 668, 746
Washington County Medical Society, 93, 186, 271, 668, 1007, 1072
Watonwan County Society, 94
West Central and Kandiyohi-Swift Societies, 271, 1072
Women's Auxiliary, 94, 187, 272, 367, 453, 568, 669, 746, 831, 935, 1008, 1072
Wright County Society, 367, 830, 1008

T

Taylor, H. Longstreet: The Ramsey County Medical Society's library, 906
Tetanus and gas gangrene, Treatment of, 142
Tetanus following induced abortion (case report), 737
Thomas, Gilbert J., and Exley, E. W.: Some of the present methods used in the diagnosis and treatment of prostatic hypertrophy, 729
Thorax, Wounds of the, 127
Throat, Sarcoma of the (case report), 552
Thrush, Vaginal (case report), 1058
Tibbetts, M. H.: Compression fractures of the vertebræ, 720
Tonsillectomy—The American rite, 790
Tovell, Ralph M.: Spinal anesthesia, 531
Toxemia, Recurring pre-eclamptic: its clinical significance, 889
Traumatic abdomen, 1047
Traumatic appendicitis (case report), 733
Treatment of Addisons' disease by the cortical hormone of Swingle and Pfiffner (case report), 442
Treatment of anal fissures, The, 910
Treatment of paranasal sinusitis, 1051
Treatment of salpingitis, 1028
Treatment of secondary deformity in cases of harelip, 514
Treatment of tetanus and gas gangrene, 142
Trichomonas vaginalis vaginitis, 1024
Tuberculosis, a public health problem, 431
Tuberculosis of the anus and rectum, 622
Tuberculosis sanatoria, Our, 437
Tuberculosis, The institutional care of, 618
Tumor, brain, The relationship of epileptic seizures to, 245
Tuohy, E. L.: General physical examination, 974
Tuohy, E. L., and Eckman, P. F.: Aorti stenosis with calcareous nodules in the aortic valves, 289
Two cases of pellagra from Minnesota, 341

U

Ude, Walter H.: The value of the roentgenologic examination of the chest, 984
Ulcer, duodenal, Recent developments in the treatment of, 953
Ulcer, peptic, and cholecystic disease, The association of, 330
Ulcer, varicose, The adhesive bandage in the treatment of, 715
Ulrich, Henry L.: Mitral disease in adults, 1021
Undulant fever, 691
Unexploited therapeutic opportunity in periodic health examination of young adults, An, 526
Unusual case of hypertension, An (case report), 175
Unusual deficiency syndrome secondary to duodenal occlusion and ulcerative colitis, 336
Urography, Intravenous, 978
Uterus, carcinoma of the, The present status of the treatment of, 943

V

Vaginal hernia, 163
Vaginal thrush (case report), 1058
Vaginitis, Non-specific, 319
Vaginitis, Trichomonas vaginalis, 1024
Value of the roentgenologic examination of the chest, The, 984
Value of the roentgenologic examination of the stomach and gallbladder, The, 987
Varicose ulcer. The adhesive bandage in the treatment of, 715
Vertebræ, Compression fractures of the, 720
Veterans' relief, The doctor takes a hand in, 765
Vinson, Porter P.: Foreign body (needle) in the esophagus (case report), 443
Vinson, Porter P., and Marshall, James M.: Carcinoma of the pancreas with esophageal obstruction from metastasis to the lymph nodes of the mediastinum (case report), 352
Vinson, Porter P., and Moersch, Herman, J.: Subcutaneous emphysema following aspiration of foreign body (case report), 654
Vincent's disease, 901
Vision, Impairment of, following head injury, 809
Vital capacity, Historic review of American and English literature on, 1031
Vulvitis, Leukoplakic, or kraurosis vulvæ: its relation to carcinoma and its surgical treatment, 312

W

Walters, Waltman, and Faust, Louis S:. Fibrosarcoma of a Meckel's diverticulum producing intestinal hemorrhage, 233
Wangensteen, Owen H.: Acute bowel obstruction, 16
Ward, George Gray: The present status of the treatment of carcinoma of the uterus, 943
Watson, J. A.: Sarcoma of the throat (case report), 552
Webb, R. C.: Hyperthyroidism complicating diabetes mellitus (case report), 546
Webb, R. C., and Anderson, Ernest R.: Hepatic abscess following acute appendicitis with recovery, 155
Weber, Harry M.: The value of roentgenologic examination of the stomach and gallbladder, 987
West, Olin: The economic trend in medicine: What is it? 121

White, Willard D.: Traumatic appendicitis (case report), 733
Willius, Frederick A.: Prognosis in heart disease, 405
Wiprud, Theodore: Experiences in county medical organization, 605
Woltman, Henry W.: Indications for spinal puncture, 996
Wood, Harry G.: Bilateral spontaneous pneumothorax: Report of a case (case report), 550
Wounds of the thorax, 127
Wright, C. B.: The doctor takes a hand in veterans' relief, 765
Wyatt, Oswald S.: Congenital hypertrophic pyloric stenosis, 540
Wyatt, Oswald S.: Omental cyst in a child (case report), 656

Y

Ylvisaker, R. S.: Functional disorders of the bowel, 411

Z

Zimmerman, H. B.: Localized actinomycosis, 75

MEDICAL STAFF--ASBURY HOSPITAL

OFFICERS

Dr. Donald McCarthy, President.
Dr. H. M. Lee, Vice-president.
Dr. Macnider Wetherby, Secretary-Treasurer.
Dr. E. A. Loomis, Member, Advisory Board.
Dr. H. O. McPheeters, Member, Advisory Board.
Dr. H. B. Dornblaser, Member, Advisory Board.
Dr. John Rishmiller, Member, Advisory Board.

ACTIVE STAFF MEMBERS

General Medicine
Dr. A. L. Herman
Dr. J. D. Lyon
Dr. Wm. W. Moir
Dr. Daniel H. Bessesen
Dr. W. A. Sawatzky
Dr. Aaron Friedell
Dr. Harold Wahlquist
Dr. D. K. Pollock
Dr. Harlow Hanson
Dr. Alfred Bessesen, Jr.
Dr. I. M. Goldberg
Dr. H. G. Armstrong
Dr. W. K. Foster
Dr. A. E. McDonald

Internal Medicine
Dr. T. A. Peppard
Dr. J. A. Meyers
Dr. C. A. McKinlay
Dr. Donald McCarthy
Dr. A. E. Cardle
Dr. Macnider Wetherby

Obstetrics and Gynecology
Dr. S. B. Solhaug
Dr. H. M. N. Wynne
Dr. H. B. Dornblaser

Genito-Urinary
Dr. Walter J. Kremer
Dr. B. A. Gingold

Pediatrics
Dr. C. A. Stewart
Dr. E. S. Platou

ACTIVE STAFF MEMBERS

Surgery
Dr. A. N. Bessesen, Sr.
Dr. R. R. Cranmer
Dr. J. F. Corbett
Dr. C. A. Hallberg
Dr. A. F. Bratrud
Dr. J. H. Rishmiller
Dr. H. M. Lee
Dr. H. F. Wiese
Dr. A. H. Parks
Dr. S. R. Maxeiner
Dr. R. C. Webb
Dr. Ralph T. Knight
Dr. C. C. Kennedy
Dr. H. O. McPheeters
Dr. A. W. Ward

Orthopedics
Dr. Paul W. Giessler
Dr. E. T. Evans

Eye, Ear, Nose and Throat
Dr. J. F. Curtin
Dr. E. A. Loomis
Dr. W. H. Fink
Dr. C. W. Waldron

Neurology
Dr. J. C. Michael

A new, fireproof building, airy and cheerful, facing the south. Every room an outside room with a pleasant outlook. Thoroughly equipped as to operating rooms, x-ray and pathological laboratories, medical, surgical and obstetrical departments. An efficient staff of doctors. An adequate nursing service. An accredited school of nursing.
The Hospital's Aim: An adequate service in a cheerful atmosphere at reasonable cost.

MISS LYDIA A. MILLER, R. N., Supt. Asbury Hospital, 916 East 15th Street, Minneapolis, Minn.

DATE DUE SLIP
UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL LIBRARY

THIS BOOK IS DUE ON THE LAST DATE STAMPED BELOW

APR 7 1932
JUN 2 1932
APR 17 1933
MAY 4 1933
JUL 12 1933
NOV 1 [illegible]

AUG [illegible] 1937
SEP 6 1937
JAN [illegible] 1939
APR 25 1939
JAN 20 1941

RETURNED
NOV 9 [illegible]

7 DAY
MAY 18 1971

RETURNED
MAY 12 1971

v.14
1931
~~1931~~
Minnesota medicine
UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL LIBRARY
~~28074~~

Harrison
APR 25 1939
APR 14 1939
JAN 20 1941
JAN 10 1941
MAR 9 - 1946
Mar 12 '46
Sep 7 48
SEP 8 1948
1949

28074